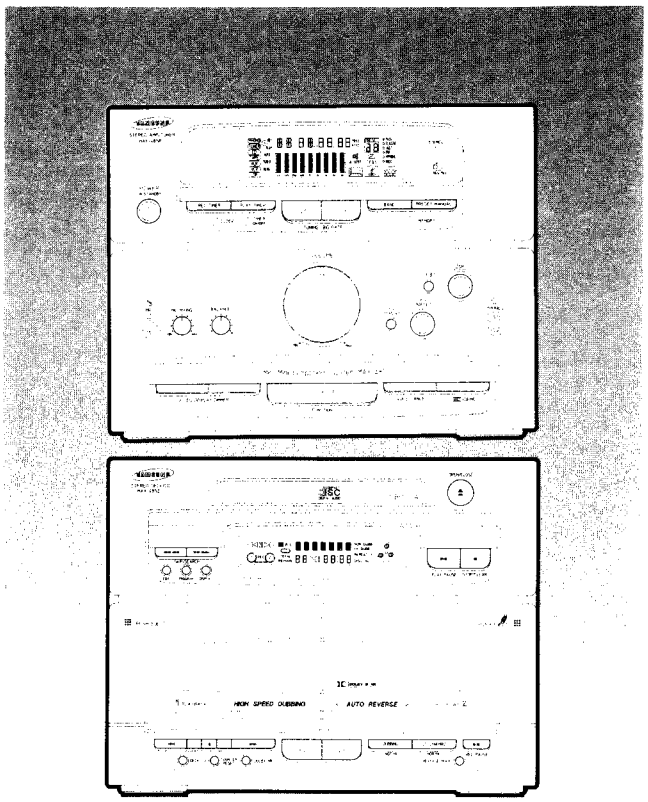
SAMSUNG

MINI COMPONENT SYSTEM

MAX - 485

SERVICE Manual

MINI COMPONENT SYSTEM



CONTENTS

1. Precaution ·····1~9
2. Specification ·····10
3. Location of controls ·····11~13
4. What is Bio Rhythm ·····14
5. Disassembly instruction ·····15
6. Basic circuit operation ·····16~26
7. Troubleshooting ·····27~34
8. Adjustment ·····35~37
9. Block diagram ·····38~39
10. Exploded view & parts list ···40~46
11. Schematic diagram ·····47~49
12. PCB Pattern and Marking diagram ···50~54
13. Wiring diagram ·····55~56
14. IC & TR internal diagram ·····57~60
15. Electrical parts list ·····61~65
16. List of Abbreviation ·····66

※ Design and specification are subject to change upon improvement without prior notice.

1. Safety precaution

1-1. Class 1 laser product

This laser disc player is classified as a CLASS 1 laser product.

1-2. Laser warning label

The label shown below may be affixed or not according to country.

(UL)

This Product Complies with DHHS Rules 21CFR, Sub chapter J.At date of Manufacture

(CSA)

CERTIFIED ONLY TO CANADIAN ELECTRICAL CODE.

CERTIFIE EN VERTU DU CODE CANADIAN DE LELETRICITE SEULEMENT

(EU)

CLASS 1
LASER PRODUCT

Location: Enclosure back.

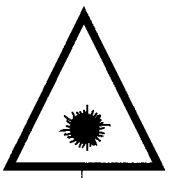
CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATEO AVOIDEXPOSURE TO BEAM

ADVARSEL: USYNLIG LASERSTRÅLING VED ABNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSAETTELSE FOR STRALING

VARO:AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTINA NAKYMATTÖMALLE LASERSATEILYLLE ALA KATSO SATEESEEN!

VARNING:OSYNLIG LASERSTRÅLNING NAR DENNA DEL AR OPPNAD OCH SPARREN AR URKOPPLAD BETRAKTA EJSTRÅLEN!

(EU)



UL : Manufactured for U.S.A. Market.
CSA : Manufactured for Canadian Market.
EU : Manufactured for European Market.
SCAN : Manufactured for Scandinavian Market.

Location : on the disc clamper or inner side of UNIT door or nearby UNIT chassis.

1-3. Laser beam warning

ADVERSEL –Usynlig saserstråling ved åbning, når Sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

VARNING –Osylig laserstralning när denna del är öppnad och spärr är urkopplad. Stralen är farlig.

VARITUS –Laite sisältää laserdiodin, joka lähettää näkymätönta silmille vaarallista lasersateilyä.

CAUTION –Invisible laser radiation when door is open and interlocks defeate. Avoid exposure to beam.

1-4. Laser diode specification (Optical pick-up)

- Material : GaAs+GaAlAs
- Wavelength : 760-800nm
- Emission duration : Continuous
- Laser Output : max. 400 μW
  * This output is the value measured at distance 1.6mm from the objective lens surface on the optical pick-up block.
- Classification : CLASS 1

1-5. Warning for servicing

WARNING: When servicing, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30cm from the surface of the objective lens on the optical pick-up block.

VARNING: När underhållningsarbeten utförs, närma dig försiktigt och se inte på laserutstrålningen på för nära häll. If all det är nödvändigt att betrygga laserstrålens utströmning. Var säker att kontrollera detta från ett avstående av mer än 30cm (11.81 inch.) fråan den objektiva linsens yta på den optiska utsåndningspunkten.

ADVARSEL: När repareringsarbejdet udfoeres, naerm dig forsigtigt og se ikke på laserudstrålingen påa for naer håand. ^t ilfaeldet at det er noedvaendigt at bestemme laserstrålens udstråling. Vaer sikker på kontrollere dette fra en afstand af mere end 30cm (11.81 inch.) fra den objektive linses overflade på den optiske udsendningspunkt.

VAROITUS: Silmiä on varottava viemästä liian läbeile laser-poistokanavaa huoiion aikana. Jos on välttämätöntä varmistaa Laser-Säteen päästö, pysyttels sitä tarkasteltaessa vähintään 30cm etäiyydellä optisen lukon objecktiivilinssin pinnasta..

1-6. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

(1) Be sure that no built-in protective devices are defective or have been defeated during servicing. (1) Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any remove for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

(2) Be sure that there are no cabinet openings throught which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

(3) Leakage Current Hot Check-With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use a isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON positin and then in the OFF position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis.

Any current measured must not exceed 0.5 millamp. Reverse the instrument power cord plug in the outlet and repeat the test.

See Figure 1.

Any measurements not within the limits specified herein indicate a potential shock hazard that must be ellminated before returning the instrument to the customer.

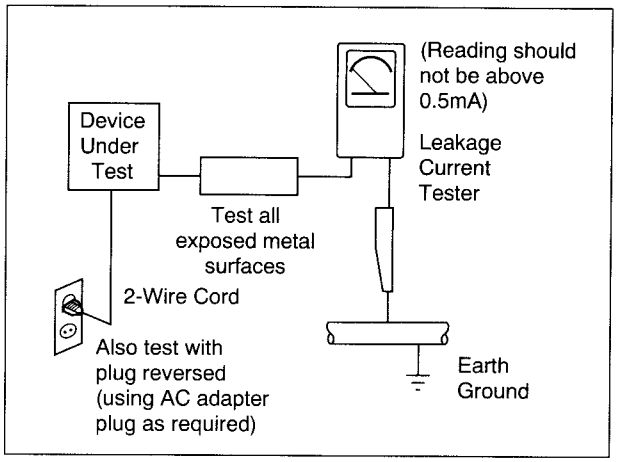

(Reading should not be above 0.5mA)
Device Under Test
Leakage Current Tester
Test all exposed metal surfaces
2-Wire Cord
Also test with plug reversed (using AC adapter plug as required)
Earth Ground

FIG. 1 AC Leakage Test

(4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repared and rechecked before it is returned to the customer.

See Figure 2.

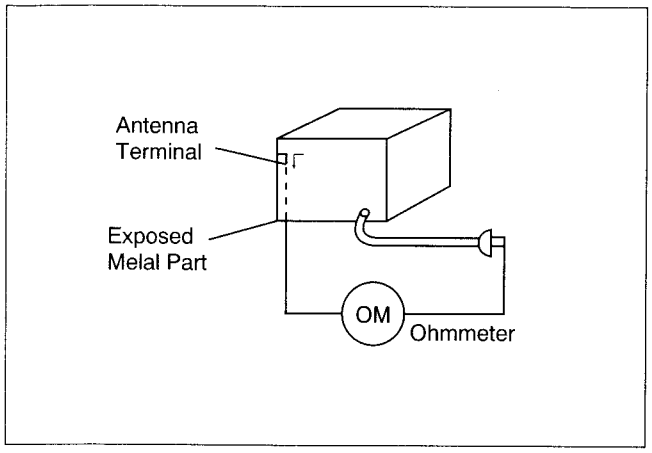


FIG. 2 Insulation Resistance Test

1-7. Read and comply with all caution and safety-related notes non or inside the cabinet, or on the chassis.

1-8. Design Afteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the servicer, responsible for personal injury or property damage resulting therefrom.

1-9. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: (1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring. Do not change spacing between a component and the printed-circuit board. Check the AC power cord for damage.

1-10. Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

1-11. Product Safety Notice-Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, an (*) or a (⚠) on schematisc and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might created shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

2. Servicing notes

2-1. Before servicing the unit

Be sure to observe the safety notes attached on label, chassis, cabinet top, cabinet bottom and printed circuit board.

2-1-1. Caution on laser beammalfunction

Do not try to access objective lens, when DISC is not on the tray.

When pick-up mechanism replacement is required, be sure to turn power off.

2-1-2. When handling parts

Tube, tape or insulating parts are used for sepa-ration or insulation purposes. Especially parts which generate excessive heat are kept away from PCB or any other sensitive parts. Therefore, when replacing parts, be sure to replace them in their original position.

2-1-3. When fixing wires

Wires should be fixed in such a way with cable-tie so they won't move.

When finished servicing, be sure to leave unit in it's original configuration.

2-1-4. Use specified parts only

The safety specification built into the electronics of this unit require that you use specified parts only. Do not use any other replacements. Using other parts can result in electrical and fire hazard.

2-1-5. After servicing is complete

After servicing is complete, check if there are any missing parts or that wires are properly fixed and any place where over heating or shock is likely to occur, can be found.

2-1-6. Handling the optical pick-up

* The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

(1) Place a conductive sheet on the work bench (The black sheet used for wrapping repair parts.)

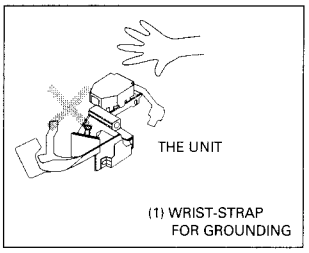
(2) Place the set on the conductive sheet so that the chassis is grounded to the sheet.

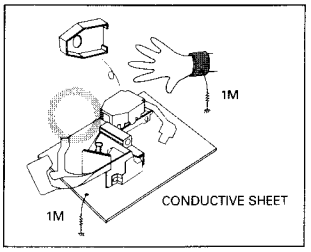
(3) Place your hands on the conductive sheet (This gives them the same ground as the sheet).

(4) Remove the optical pick up block.

(5) Perform work on top of the conductive sheet. Be careful not to let your clothes or any other static sources to touch the unit.

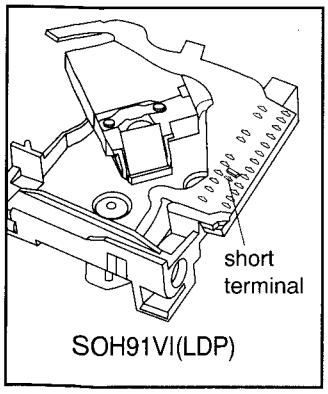
* Be sure to put on a wrist strap grounded to the sheet.
* Be sure to lay a conductive sheet made of copper etc. which is grounded to the table.



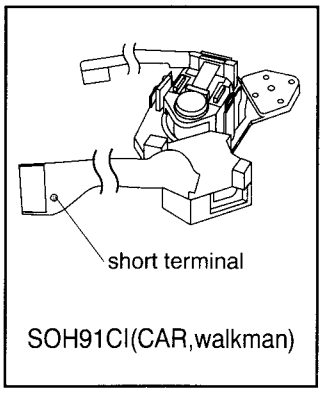


(6) Short the short terminal on the PCB, which is inside the Pick-Up ASS'Y, before replacing the Pick-Up.
(The short terminal is shorted when the Pick-Up Ass'y is being lifted or moved.)

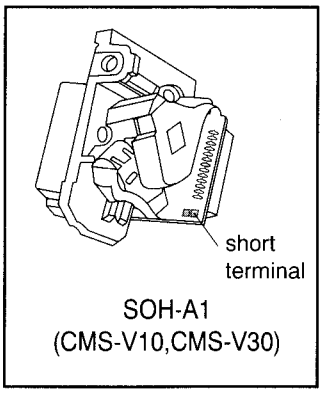
(7) After replacing the Pick-up, open the short terminal on the PCB.



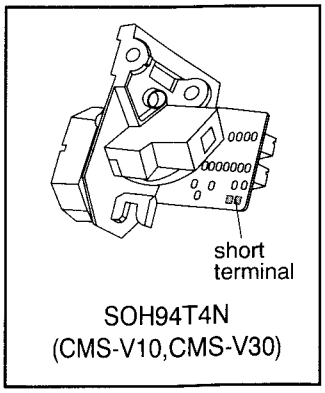
SOH91VI(LDP)



SOH91CI(CAR,walkman)



SOH-A1
(CMS-V10,CMS-V30)



SOH94T4N
(CMS-V10,CMS-V30)

2-2. Servicing Precautions

CAUTION: Before servicing Instruments covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note: If unforseen circument create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.
Remember: Safety First.

2-2-1. General Servicing Precautions

(1) a. Always unplug the instrument's AC power cord from the AC power source before (1) removing or reinstalling any component, circuit board, module or any other instrument assembly, (2) disconnecting any instrument electrical plug or other electrical connection, (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

b. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

c. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead.
Always remove the test instrument ground lead last.

Note: Refer to the Safety Precautions section ground lead last.

(2) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.

(3) The components used in the unit have a specified flame resistance and dielectric strength. When replacing components, use components which have the same ratings. Components identified by shading, by (*) or by (⚠) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace them with the exact replacement components.

(4) An insulation tube or tape is sometimes used and some components are raised above the printed wiling board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install such elements as they were.

(5) After servicing, always check that the removed screws, corponents, and wiring have been installed correctly and that the portion around the serviced part has not been damaged and so on. Further, check the insulation between the blades of the attachment plug and accessible conductive parts.

2-2-2. Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power ON. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (see note) should be more than 1 Megohm.

Note: Accesible conductive parts include metal panels, input terminals, earphone jacks, etc.

2-3. ESD, Precautions

Electrostatically SensitiveDevices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity.
Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

(1) Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic aharge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

(2) After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

(3) Use only a grounded-tip soldering iron to solder or unsolder ESD devices.

(4) Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.

(5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damge ESD devices.

(6) Do not remove a replacement ESD device from its protective package until immediately before your are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).

(7) Immediately before removing the protective materials from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

(8) Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

3. Chip replacement

3-1. Precaution for the Chip Replacement

(1) Do not touch the part body directly with the soldering iron. ICS, especially TSOP, are easily damaged by heat.
(2) Use care regarding soldering iron tip and avoid rapidly heating parts. Some parts can be damaged by sudden heating. Preheat the part at about 100°C for several minutes before installing it.
(3) Use soldering tip temperature of about 240°C or larger parts, use a slightly higher temperature (about 280°C).
(4) The thin (0.3mm) solder for miniature parts does not contain adequate flux. Supplementary flux is thus needed in most cases.

The NoteMaster 486S/25N series systems are manufactured using flux which can be cleaned by water in the factory. When your replace the part or troubleshooting, use proper flux and solder which can be cleaned by water. Soldering area will corrode, if proper flux and solder are not used in replace. And it may cause a fatal error to the system.

(5) Use care not to damage the circuit pattern, especially when removing.
(6) Because of the many pins, cleanliness of the pattern is extremely important after removing the IC.
(7) Use care to avoid solder bridges. Remove any that occurs.
(8) Position the part carefully. This will also affect the soldering operation. Be very precise in positioning the IC. Soldering opposite pins first holds the IC in place and makes soldering the other pins easier.
(9) Do not reuse removed parts.
(10) Check for solder joints, especially miniature parts with small lead.
(11) A defective trimming resistor cannot be adjusted externally. Replace with an ordinary variable resistor.
(12) It is important to inspect the work with a magnifier. Check after installing (cold solder joints, etc).

3-2. Tools for the Chip Replacement

The tools for the chip replacement are as follows:

(1) Thin tip type soldering iron
(2) Small flat-blade tip type soldering iron
(3) Special desoldering tip iron
(4) Airblower unit
(5) Flat Package Pick-up
(6) Flux can be cleaned by water
(7) 0.3mm thin solder can be cleaned by water
(8) Desoldering wire
(9) Tweezers

3-3. Chip Resistors and Chip Capacitors

3-3-1. Kind jof the Part

The kind of chip resistors and chip capacitors as follows

(1) Thick Film Chip Resistors
(2) Carbon Film Chip Resistors
(3) Metal Film Chip Resistors
(4) Chip Ceramic Capacitors
(5) Chip Trimming Resistors

3-3-2. Removing the Part

The kind of chip resistors and chip capacitors as follows

(1) Using two soldering irons:
① Use thin tip soldering irons.
② Use soldering tip temperature of about 280°C
③ Simultaneously heat both ends of the part.
④ While heating, grasp the part with the tips of the soldering irons and remove it.
⑤ Use desoldering wire to completely remove the old solder from the part location of the board.
⑥ A clean pattern for installing the new part is very important.

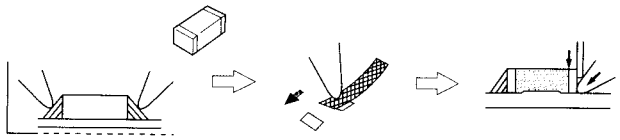


FIG. 4

3-3-3. Installing the Part

(1) Clean the area where the new part is to be mounted.
(2) Apply flux.
(3) Set part correctly into position, prevent it from shifting.
(4) Bring the soldering iron tip close to the part contact without actually touching it. Melt thin (0.3mm) solder between the tip and part so that it flows into the part contact.
(5) Check work quality with a magnifier.

3-4. Chip Tantalum Capacitors and Chip Filters

3-4-1. Kind of the Part

The kind of chip tantalum capacitors and chip filters are as follows:

(1) Chip Inductors
(2) Chip Tantalum Capacitors
(3) Chip Tantalum Electrolytic Capacitors
(4) Chip Aluminum Electrolytic Capacitors
(5) Chip Transformers
(6) Chip Filters

3-4-2. Removing the Part

(1) Using special desoldering iron:
① Select soldering tip according to part size.
② Bring the tip into contact with the soldered points.
③ When the solder melts, remove the part.
④ Remove the old solder with desoldering wire.

(1) Using two soldering irons:
① Use small flat-blade tips.
② Heat both ends of the part simultaneously.
③ When the solder melts, grasp and remove the part with the soldering iron tips.
④ Remove the old solder with desoldering wire.

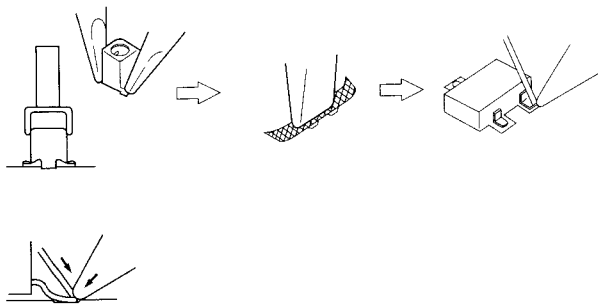


FIG. 5

3-4-3. Installing the Part

(1) Clean the area where the new part is to be mounted.
(2) Apply flux
(3) In part correctly into position, prevent it from shifting.
(4) Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that if flows into the part contact.
(5) Check work quality with a magnifier.

3-5. Chip VRs, Chip Trimmer Capacitors, Diodes and Tr.

3-5-1. Kind of the Part

The kind of the part is as follows:

(1) Chip VRs
(2) Chip Trimmer Capacitors
(3) Diode
(4) Transistors

3-5-2. Removing the Part

(1) Using two soldering irons:
① Use small flat-blade tips.
② Heat the leads of the part simultaneously.
③ When the solder melts, grasp and remove the part with the soldering iron tips.
④ Remove the old solder with desoldering wire.

3-5-3. Installing the Part

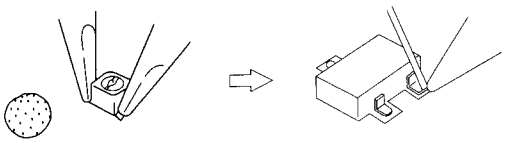


FIG. 6

(1) Clean the area where the new part is to be mounted.
(2) Apply flux
(3) Set part correctly into position, prevent it from shifting.
(4) Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that it flows into the part contact.

3-6. Chip ICs

3-6-1. The kind of the Chip ICs

The kind of the chip ICs are as follows:

(1) SOP (Small Outline Package) IC
(2) SSOP (Shrink Small Outline Package) IC
(3) VSOP (Very Small Outline Package) IC
(4) QFP (Quad Flat Package) IC
(5) VQFP (Very Quad Flat Package) IC
(6) PLCC (Plastic Leaded Chip Carrier) IC
(7) TSOP (Thin Small Outline Package) IC

3-6-2. Removing the Part

(1) Using special desoldering iron:
① Select the tip according to the size and shape of the IC.
② Thin" the tip with a small amount of the IC leads.
③ Set the tip squarely over the IC leads.
④ When the solder melts, carefully twist the iron.
⑤ Raise and remove the IC.

(2) Using shaped airblower unit:
① Select the correct nozzle.
② Select the temperature and airblow (suggested: temperature: 7, airblow: 4)
③ Engage the IC removing tool.
④ Use the airblow to preheat the IC for about 5 seconds, then heat with the nozzle until the IC remover lifts the part from the board.

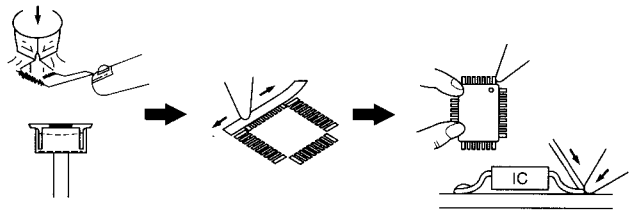


FIG. 7

3-6-3. Installing the Part

(1) Use desoldering wire to remove the previous older.
(2) Clean the location.
(3) Apply flux.
(4) Position the IC and solder two pins at opposite sides.
(5) Use a sharp tipped soldering iron and carefully solder each pin. (After graining experience, a thicke tip can be used for better work efficiency.)
(6) Remove any solder bridges with desoldering wire.
(7) Inspect the work with a magnifier.

2. Specification

2-1. General section

2-1-1. Power source.....220V 50Hz
2-1-2. Power consumption.....150W
2-1-3. Dimension.....270(W) X 326(D) X 210(H) X 2 EA

2-2. Amp section

2-2-1. Power output.....30W (D.T 10%)
2-2-2. Frequency response.....20Hz ~ 20kHz(±3 dB)
2-2-3. Signal to noise ratio.....70 dB
2-2-4. Separation .....50 dB

2-3. Radio section

2-3-1. FM section

(1) Frequency range.....87.5MHz ~ 108MHz
(2) Usable sensitivity.....6μV
(3)Signal to noise ratio.....65 dB
(4) Separation(STEREO).....35 dB

2-3-2. MW section

(1) Frequecny range.....522 ~ 1611kHz
(2) Signal to noise ratio.....40 dB
(3) Usable sensitivity.....600μV

2-3-3. LW section(Option)

(1) Frequency range.....146 ~ 290kHz
(2) Signal to noise ratio.....35 dB
(3) Usable sensitivity.....1000μV

4. Cassette deck section

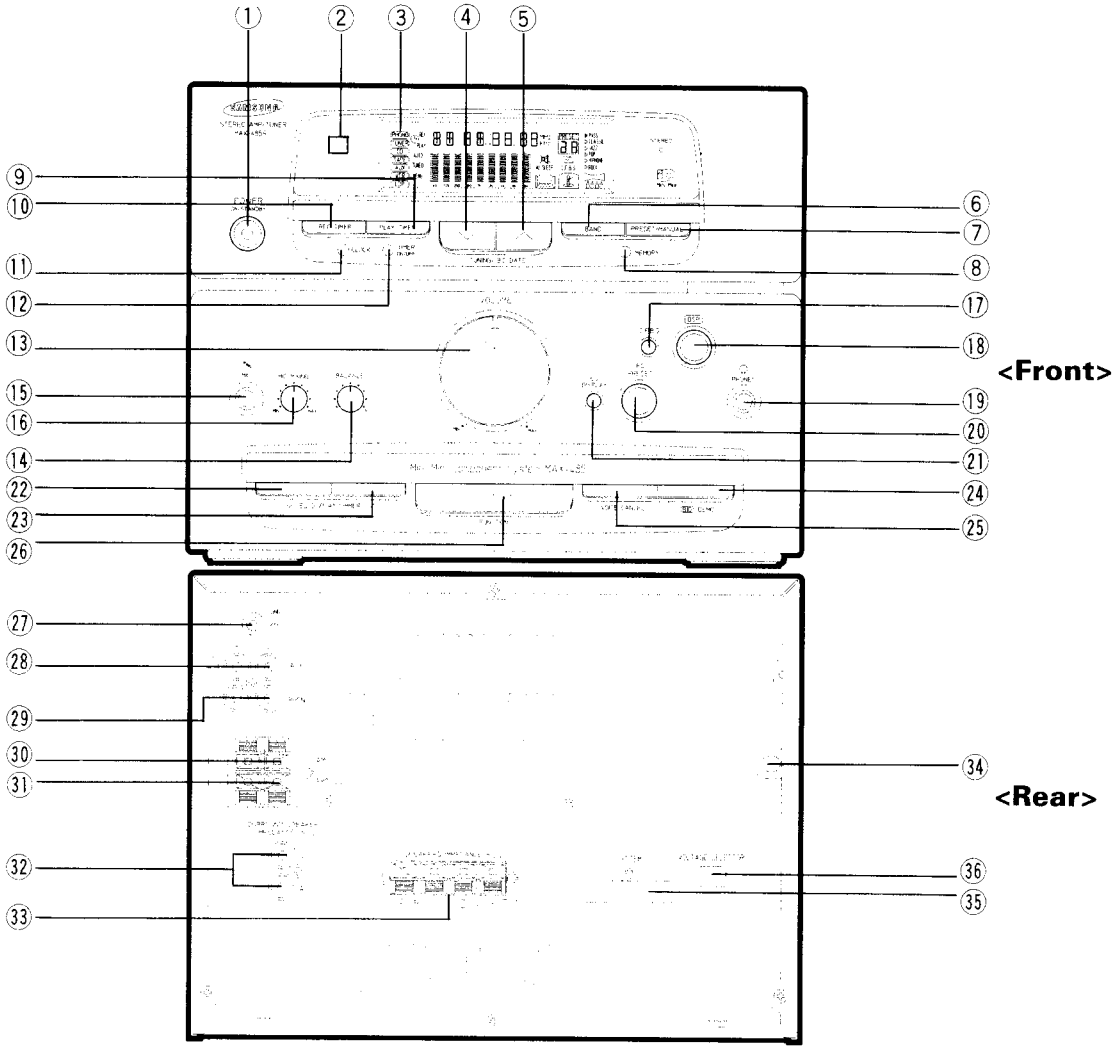
2-4-1. Frequency range.....125Hz ~ 12.5kHz
2-4-2. Signal to noise ratio.....45 dB
2-4-3. Separation(STEREO).....35 dB
2-4-4. Total harmonic distortion.....2%(Recording mode)
2-4-5. Erasing effect.....65 dB

5. Compact disc section

(1) Frequency response.....20 Hz ~ 20kHz(±1dB)
(2) Signal to noise ratio.....85 dB(1kHz 0 dB)
(3) Channel separation.....75 dB(1kHz 0 dB)
(4) Total harmonic distortion.....0.02% (1kHz 0 dB)
(5) D/A conversion.....1 bit

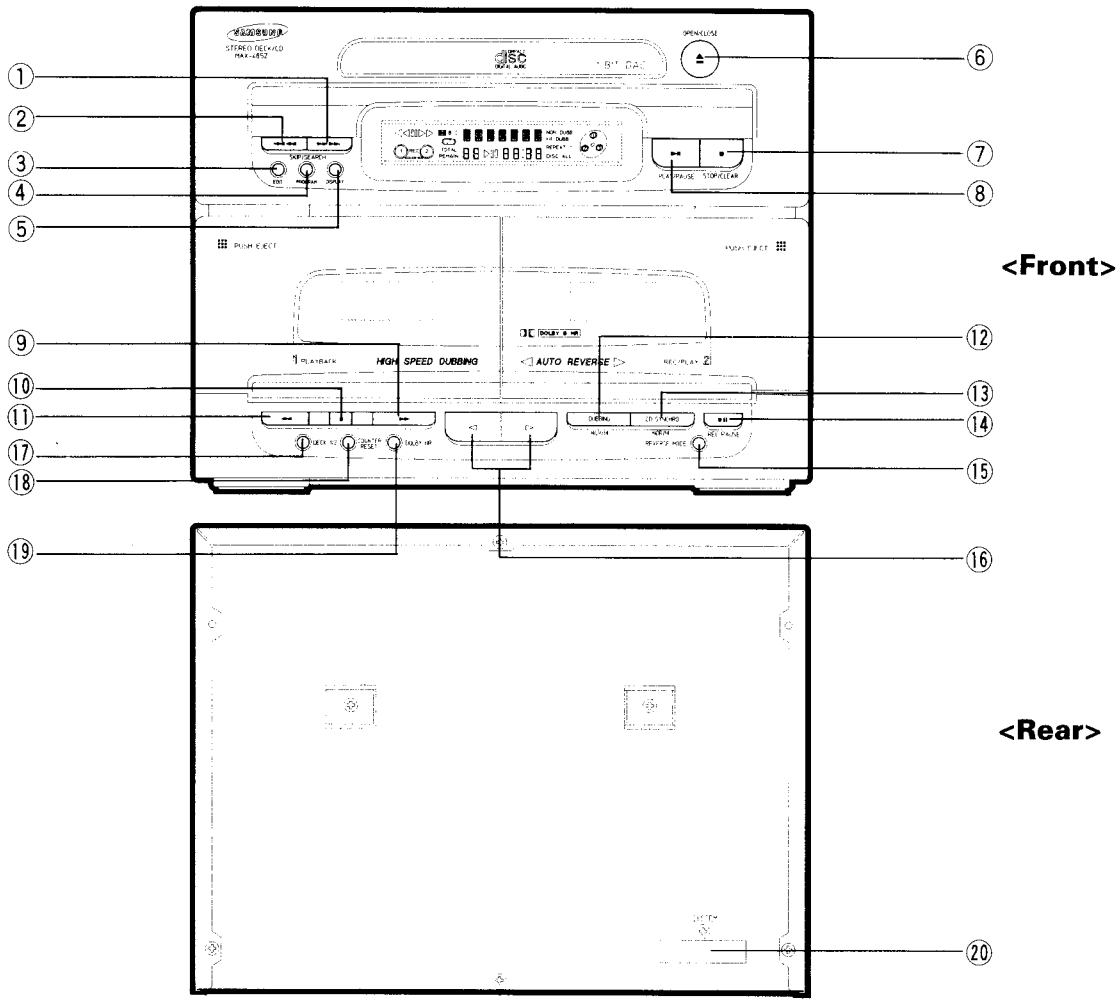
3. Location of controls

3-1. Amp/tuner section



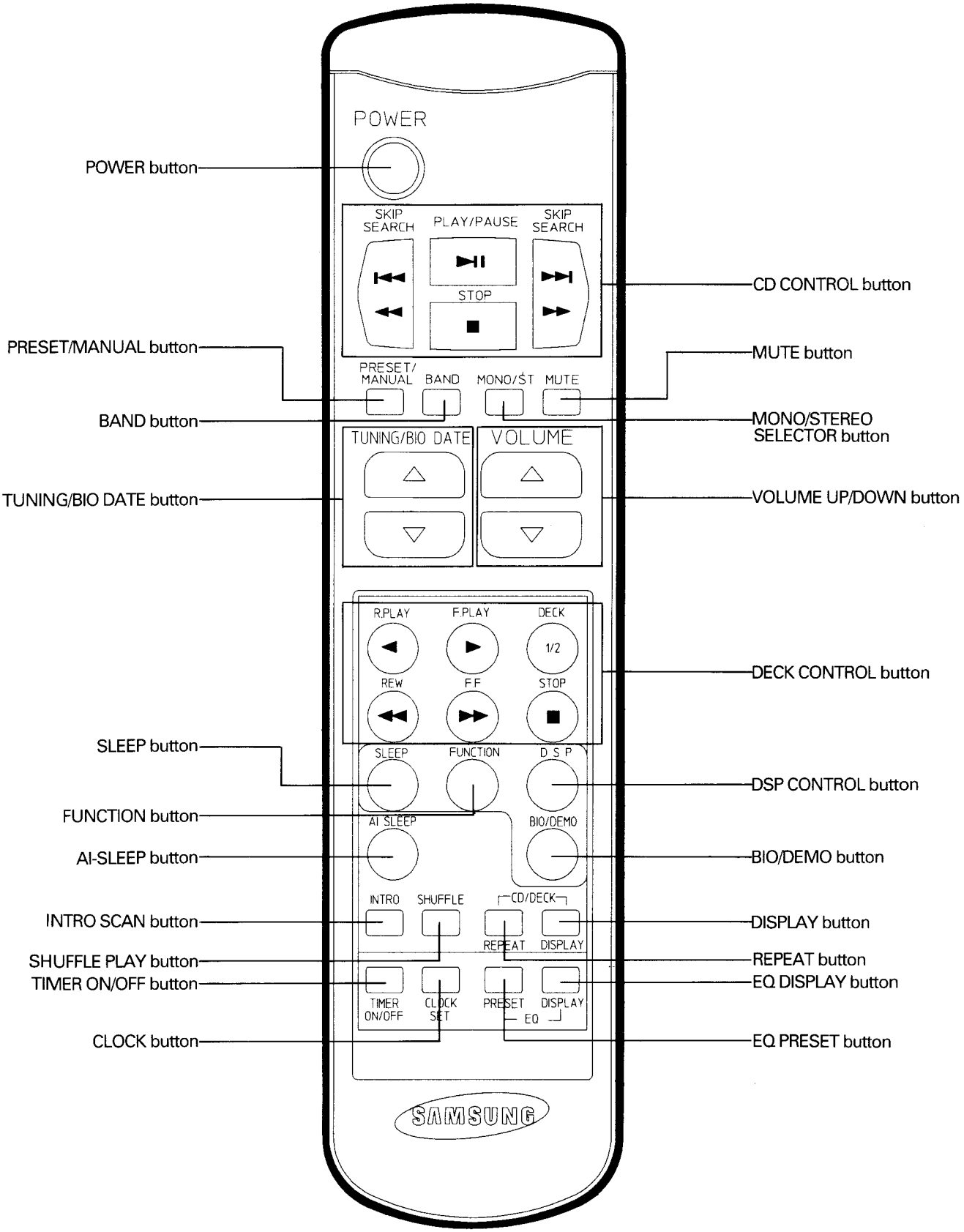
1. POWER button
2. REMOTE sensor
3. DISPLAY
4. TUNING/BIO DOWN button
5. TUNING/BIO UP button
6. BAND SELECTOR button
7. PRESET/MANUAL button
8. MEMORY button
9. PLAY TIMER button
10. RECORD TIMER button
11. CLOCK button
12. TIMER ON/OFF button
13. VOLUME
14. BALANCE
15. MIC input jack
16. MIC MIXING jack
17. C.F.B.S button
18. DSP SELECTOR button
19. HEADPHONE jack
20. EQ PRESET button
21. EQ DISPLAY button
22. EQ DISPLAY DIMMER down button
23. EQ DISPLAY DIMMER up button
24. BIO/DEMO button
25. CD VOICE CANCEL button
26. FUNCTION SELECTOR button
27. PHONO GROUND terminal
28. AUX input jack
29. PHONO INPUT jack
30. AM ANTENNA terminal
31. FM ANTENNA terminal
32. SURROUND SPEAKER terminal
33. SPEAKER terminal
34. POWER CORD
35. SYSTEM CONNECTION jack
36. VOLTAGE selector (option)

3-2. CD/deck section



1. F.FWD SKIP/SEARCH button(CD)
2. REWIND SKIP/SEARCH button(CD)
3. EDIT button (CD)
4. PROGRAM button (CD)
5. DISPLAY button
6. OPEN/CLOSE button (CD)
7. STOP/CLEAR button (CD)
8. PLAY/PAUSE button (CD)
9. F.FWD button (DECK)
10. STOP button(DECK)
11. REWIND button(DECK)
12. DUBBING button(NORMAL/HI-SPEED)
13. CD SYNCHRO button(NORMAL/HI-SPEED)
14. REC PAUSE button
15. REVERSE MODE button
16. PLAY button(DECK)
17. DECK SELECTOR button
18. COUNTER RESET button
19. DOLBY NR button
20. SYSTEM CONNECTION

3-3. Remote control



4. What is Bio-Rhythm

The scientists found three types of rhythmic activities exist in a human body; each going through a transition cycle from a highest phase to a lowest phase in a regular interval. By retracing the rhythmic pattern they also found that all the patterns are directly related to each person's birthday.

That means the moment a fetus is born out of mother, all three physical rhythms start to be active by experiencing its very first exposure to the outside stimulations such as light, sound, temperature, air and other factors.

This fact indicates that Bio-Rhythm can be determined for a person, once we identify the person's birthday.

4-1. How to Interpret the Graphics of Bio-Rhythm

■ Our product, MAX-485, is made with a calculating method according to the international standard.

TYPES	DESCRIPTION	CONDITIONS OF RYTHMIC PHASES		
		ASCENDING	DESCENDING	CRITICAL
PHYSICAL RYTHM	Physical strength Stamina. Physical tension. Courage	An increased physical strength. Heavy work performance. Quick recovery. Good for travel and sports.	A decrease in physical strength. Fatique. Needs rest constantly	Outburst of fever. Losing body heat. Prone to cold, headache and accidents.
SENSITIVITY RYTHM	Sensitivity. Sensibility. Creativity. Cooperative spirit.	Energetic. Very active. Better work performance. Seeks for love and dates	Lethargic. Acting passive. Avoids heavy duty work or any creative work	Emotionally unstable. Frequent mood swings. Short temper. An impropiety in speech. Becomes the source of gossip Worsening of illness.
RYTHM FOR INTEL-LIGENCE	Intelligence. Thinking power. Improved memory. Better concentration.	-Brain Activity- Quick thinking, Active brain function. Good for planning, drafting, review critical judgement. Improved memory and comprehansion of difficult subjects.	-Low Brain Function- Low brain activity. Avoid heavy brain work. Do light work such as data organiztionor review.	Lack of the ability of concentration. Not be able to pay attention. Makes mistakes. Posponement of making important decisions.

4-2. The Function of Bio Sound Quality

After marking the three types of Bio functions, the most appropriate sound quality is chosen for that particular day's Bio-Rhythm depending on the person's sensitivity rhythm. For the person on the ascending phase, a strong quality sound like Rock Music is selected, so that the person could raise his or her work performance rate and result by asserting him/herself more. For the person on the descending phase, a soft quality sound like classical music, so that the person could take a rest or get relaxed.

5. Disassembly instruction

Before you start the disassembly, disconnect power cord.

5-1. Amp & Tuner section

5-1-1. To Disassemble cabinet-top: FIG. 1

(1) Remove 7 screws ([1]) from the cabinet-top .
(2) Disassemble the cabinet-Top in the Ⓐ direction.

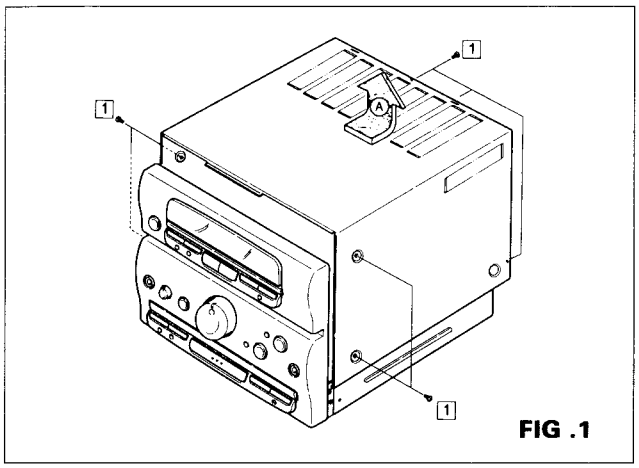


FIG .1

5-1-2. To Disassemble the cabinet-rear: FIG. 2

(1) Remove 10 screws([1]).
(2) Disassemble the cabinet-rear in the Ⓑ direction.

5-1-3. To Disassemble the cabinet-front: FIG. 2

(1) After pulling the volume knob in the arrow direction Ⓐ, unscrew the 2 screws([3]) connected to the volume.
(2) Remove 2 screws([2]).
(3) Pull the front forward in order to disassemble it.

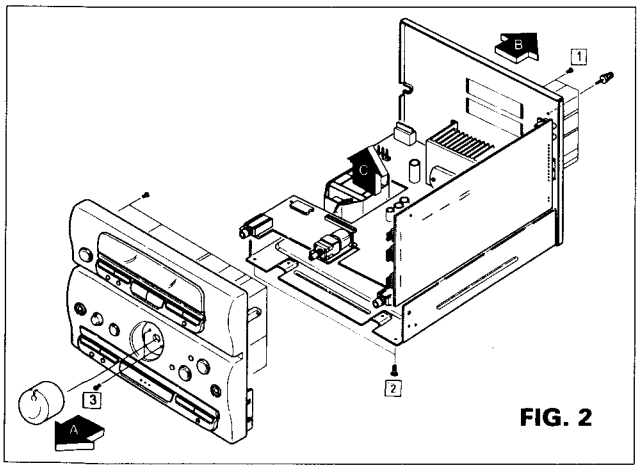


FIG. 2

5-2. CDP & Cassette deck section

5-2-1. To disassemble the cabinet-top: FIG. 3

(1) Remove the 7 screws([1]).
(2) Disassemble the cabinet-top in the Ⓐ direction.

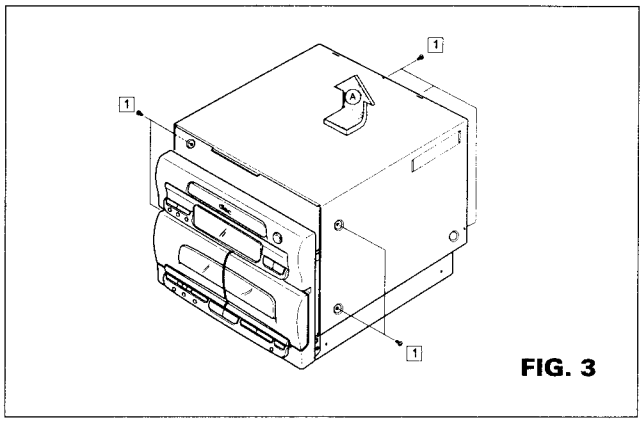


FIG. 3

5-2-2. To disassemble the CDP Deck: FIG. 4

If the door is opened, then use your hand to push the Door-CD all the way toward cabinet-rear.
(1) Remove 4 screws([1],[2])
(2) Disassemble the CDP Deck in the arrow Ⓑ direction.

5-2-3. To Disassemble the rear part: FIG. 4

(1)Remove 2 screws([5]).
(2) Disassemble the Rear part in the arrow (A) direction.

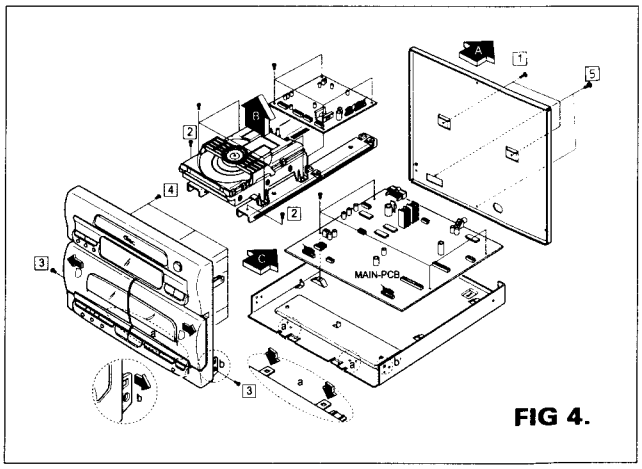


FIG 4.

2-4. To Disassemble the Cassette Deck: FIG 4

(1) Push the open/close button on the Cassette Deck to open the door.Then push the Cassette Door ([1],[2]) in the Ⓓ direction to disassemble it.
(2) Turn 7 screws ([4]) fixed to the Cassette Deck counter-clockwise to disassemble.
(3) Pull the Cassette Deck Assembly toward Ⓒ direction to take it apart.

6. Basic circuit operation

6-1. Amp / Tuner Section

6-1-1. DSP section M65830P: TIC12

Pin No.	Name	I/O	Function	Active
1	VDD	-	Digital Vdd supply voltage	
2	X IN	I	Oscillator input connects to 2MHz ceramic filter or inputs an external clock	
3	X OUT	O	Oscillator output connects to 2MHz ceramic filter	
4	REQ	I	Request inputs request data from μ-com	
5	SCK	I	Shift clock inputs shift clock from μ-com	
6	DATA	I	Serial data inputs serial data from μ-com	
7	IDSW	I	ID switch controls ID code	
8	IDFLAG	O	ID flag outputs pulse at setting function mode and function mode data	
9	TEST1	I	L= normal mode	
10	TEST2	I	L= normal mode	
11	D GND	-	Digital GND connects to analog GND at one point	
12	A GND	-	Analog GND connects to analog GND	
13	LPF2 OUT	O	Low pass filter2 output forms low pass filter with external C.R	
14	LPF2 IN	I	Low pass filter2 input forms low pass filter with external C.R	
15	OP2 OUT	O	OP-AMP2 output forms integrator with external C	
16	OP2 IN	I	OP-AMP2 input forms integrator with external C	
17	CC2	-	Current contrl 2	
18	CC1	-	Current contrl 1	
19	REF	-	Reference = 1/2Vcc	
20	OPI IN	O	OP-AMP1 input forms integrator with external C.R	
21	OP1 OUT	O	OP-AMP1 output forms integrator with external C.R	
22	LPF1 OUT	O	Low pass filter1 output forms low pass filter with external C.R	
23	LPF1 IN	I	Low pass filter1 input forms low pass filter with external C.R	
24	VCC	-	Analog Vcc supply voltage	

6-1-2 μ-COM(LC866232-5548): FIC1

Port	No.	Name	I/O	Operation	Active
P5 2	1	DSPLED	○	DSP ILL-KEY LED	H
PWM1	2			Not Used	
P2 0	3	VR-UP	○	MOTOR VOLUME UP	H
P2 1	4	VR-DW	○	MOTOR VOLUME DOWN	H
P2 2	5	VR-LED	○	MOTOR VOLUME LED	L
P2 3	6	EQ-LED	○	EQ PRESET ILL-KEY LED	H
P2 4	7	MUTE	○	AUDIO MUTE	H
P2 5	8	MUTE2	○	TUNER MUTE	H
P2 6	9	POUT	○	POWER RELAY ON/OFF	H
P2 7	10	VOCAL	○	VOCAL CANCEL	L
TEST	11	TEST	I	Open(NC)	
RES	12		I	Reset Input	
XT1	13		I	Vdd 32.768 kHz Crystal	
XT2	14		○	Open 32.768 kHz Crystal	
VSS	15	GND		Gnd	
CF1	16		I	12MHz Resonator	
CF2	17		I	12MHz Resonator	
VDD	18		○	Micom Vdd	
P8 0	19	POT1	I	DTS OPTION A/D INPUT	
P8 1	20	POT2	I	DTS OPTION A/D INPUT	
P8 2	21	POT3	I	H=Export, L=Domestic	
P8 3	22		I	Not Used(B^+)	
P8 4	23	SPA1	I	16KHz EQ LEVEL INPUT	
P8 5	24	SPA2	I	60Hz-80KHz MUX INPUT	
P8 6	25	KEY2	I	A/D KEY INPUT2	
P8 7	26	KEY1	I	A/D KEY INPUT1	
P7 0	27	INTO	I	Not Used(B^+)	
P7 1	28	PSNS	I	POWER CODE OFF INPUT	L
P7 2	29	INT2	I	Not Used(B^+)	
P7 3	30	REMOCN	I	REMOCON SIGNAL INPUT	L
S 0	31	GRID1	○	GRID OUTPUT	
S 1	32	GRID2	○		
S 2	33	GRID3	○		
S 3	34	GRID4	○		
S 4	35	GRID5	○		
S 5	36	GRID6	○		
S 6	37	GRID7	○		
S 7	38	GRID8	○		
S 8	39	GRID9	○		
S 8	40	GRID10	○		
S 10	41	GRID11	○		
S 11	42	GRID12	○		
S 12	43	GRID13	○		
S 13	44	GRID14	○		
S 14	45	GRID15	○		
S 15	46	GRID16	○		
VDP	47		I		
VP	48		I		

Port	No.	Name	I/O	Operation	Active
S 16	49	SEG16	○		
S 17	50	SEG15	○		
S 18	51	SEG14	○		
S 19	52	SEG13	○		
S 20	53	SEG12	○		
S 21	54	SEG11	○		
S 22	55	SEG10	○		
S 23	56	SEG9	○	SEGMENT OUTPUT	
S 24	57	SEG8	○		
S 25	58	SEG1	○		
S 26	59	SEG2	○		
S 27	60	SEG3	○		
S 28	61	SEG4	○		
S 29	62	SEG5	○		
S 30	63	SEG6	○		
S 31	64	SEG7	○		
PO 0	65	EQCV1	○	PRESET EQ OUTPUT	
PO 1	66	EQCV2	○	PRESET EQ OUTPUT	
PO 2	67	EQCV3	○	PRESET EQ OUTPUT	
PO 3	68	EQCV4	○	PRESET EQ OUTPUT	
PO 4	69	EQCV5	○	PRESET EQ OUTPUT	
PO 5	70	EQCV6	○	PRESET EQ OUTPUT	
PO 6	71	CFBS	○	CFBS OUTPUT	
PO 7	72	CEO-S	○	LC7821 CF	
PI 0	73	DA0-C	○	DATA OUT IC	
PI 1	74		I	Not used (B^+)	
PI 2	75	CLK-C	○	CLOCK IN	
PI 3	76	DA0-S	○	DATA OUT SYSTEM	
PI 4	77	DAI-S	○	DATA IN SYSTEM	
PI 5	78	CLK-S	○	CLOCK SYSTEM	
PI 6	79	LM7000	○	LM7000 CE	H
PI 7	80	REQ-S	○	REQUEST SYSTEM	L
P3 0	81	STRQ	○	STRQ OUTPUT	G
P3 1	82	STOUT	I	STOUT INPUT	L
P3 2	83	SD	I	SD INPUT	L
P3 3	84	MONOLD	○	MONO LED(H=ST LED)	L
P3 4	85	MONO	○	H=MONO, L=STEREO	H
P3 5	86	ED4	○	ECHO D4 (65831P)	H
P3 6	87	ED3	○	ECHO D3 (65831P)	H
P3 7	88	EOFF	○	ECHO OFF	H
VSS	89			Vss	
VDD	90			Vdd	L
P4 0	91	REQ		DSP REQUEST(6538P)	
P4 1	92	SCK		DSP CLOCK (65830P)	
P4 2	93	DSP-A		DSP-B SHORT	H
P4 3	94	DSP-B		DSP MUX B	H
P4 4	95	DSP-C		DSP MUX C	H
P4 5	96	EQ-A		EQ MUX A	H
P4 6	97	EQ-B		EQ MUX B	H
P4 7	98	EQ-C		EQ MUX C	H
P5 0	99	DATA		DSP DATA (65380P)	
P5 1	100			Not Used	

6-2. Deck section

6-2-1. μ-COM(LC866216-5652) : UIC1

Port	No.	Name	I/O	Operation	Active
P5 2	1	LD-XRS	○	LD ON+XRST	
PWM 1	2		○		
P2 0	3	SENSE	I		
P2 1	4	FOX	I	FOCUS OK	
P2 2	5	GFS	I		
P2 3	6	FMV-CE	○	CHIP ENABVLE FOR FMV CONTROL	
P2 4	7	FMPHA	○	EMPHASIS CONTROL	
P2 5	8	DATA	○	DSP/SSP CONTROL COMMUNICATION	
P2 6	9	XLT	○		
P2 7	10	MCK	○		
TEST	11		○		
RES	12		I	Reset	
XT1	13		I	Connection of VDD	
XT2	14		○	Open	
VSS	15	GND		Vss	
CF 1	16		I	12MHz	
CF 2	17		○	12MHz	
VDD	18			VDD	
P8 0	19	V10S/W		Not Used	
P8 1	20		I		
P8 2	21	CLOSE	I	CLOSE CHECK SWITCH	
P8 3	22	OPEN	I	OPEN CHECK SWITCH	
P8 4	23		I		
P8 5	24	OPTION	I	3-CD/A DECK REVERSE OPTION	
P8 6	25	KEY0	I	A/D KEY INPUT 0	
P8 7	26	KEY1	I	A/D KEY INPUT 1	
P7 0	27	SCOR	I	SCOR INTERRUPT	
P7 1	28	S.REQ	I	SYSTEM CONTROL REQUEST	
P7 2	29	TRAY.S	I	Not used	
P7 3	30		I		
S 0	31		○	GRID	
S 1	32		○	GRID	
S 2	33	GRID1	○	GRID	
S 3	34	GRID2	○	GRID	
S 4	35	GRID3	○	GRID	
S 5	36	GRID4	○	GRID	
S 6	37	GRID5	○	GRID	
S 7	38	GRID6	○	GRID	
S 8	39	GRID7	○	GRID	
S 9	40	GRID8	○	GRID	
S 10	41	GRID9	○	GRID	
S 11	42	GRID10	○	GRID	
S 12	43	GRID11	○	GRID	
S 13	44	GRID12	○	GRID	
S 14	45	GRID13	○	GRID	
S 15	46	GRID14	○	GRID	
VDP	47		○	VDD	
VP	48		○	VP	

Port	No.	Name	I/O	Operation	Active
S 16	49	SEG16	○	SEG	
S 17	50	SEG15	○	SEG	
S 18	51	SEG14	○	SEG	
S 19	52	SEG13	○	SEG	
S 20	53	SEG12	○	SEG	
S 21	54	SEG11	○	SEG	
S 22	55	SEG10	○	SEG	
S 23	56	SEG9	○	SEG	
S 24	57	SEG8	○	SEG	
S 25	58	SEG1	○	SEG	
S 26	59	SEG2	○	SEG	
S 27	60	SEG3	○	SEG	
S 28	61	SEG4	○	SEG	
S 29	62	SEG5	○	SEG	
S 30	63	SEG6	○	SEG	
S 31	64	SEG7	○	SEG	
PO 0	65	OPENM	○	OPEN MOTOR	
PO 1	66	CLOSEM	○	CLOSE MOTOR	
PO 2	67	V10M-	○	Not Used	
PO 3	68	V10M+	○	Not Used	
PO 4	69	TRAYM+	○	Not Used	
PO 5	70	TRAYM-	○	Not Used	
PO 6	71	DMOTOR	○	DECK MOTOR	
PO 7	72	SOL2	○	B DECK SOLENOID	
PI 0	73	SOL1	○	A DECK SOLENOID	
PI 1	74	SUBQ	I	SUBQ DATA INPUT (SUBQ RECEIVE)	
PI 2	75	SQCK	○	SUBQ CLOCK	
PI 3	76	SDO	○		
PI 4	77	SDI	I	SYSTEM CONTROL	
PI 5	78	SCLK	I		
PI 6	79	TUNERH	○	TUNER FUNCTION(H)	
PI 7	80	H-DUBB	○	HIGH SPEED DUBBING(H)	
P3 0	81	R-REC	I	R REC PROTECTION(L)	
P3 1	82	HALL-B	I	B DECK MODE (PLAY/FF/REW L)	
P3 2	83	B-IN	I	B DECK TAPE IN(L)	
P3 3	84	F-REC	I	F REC PROTECTION(L)	
P3 4	85	HALL-B	I	HALL B(AUTO STOP/COUNT)	
P3 5	86	HODE-A	I	A DECK MODE(PLAY/FF/REW L)	
P3 6	87	A-IN	I	A DECK TAPE IN(L)	
P3 7	88	HALL-A	I	HALL A (AUTO STOP/COUNT)	
VSS	89			VDD	
VDD	90			VSS	
P4 0	91	AMPSIN	I	AMPS SIGNAL IN(LOW CHECK)	
P4 1	92	POWER	○	POWER ON(H)/OFF(L)	
P4 2	93	CD-F	○	CD FUNCTION(H)	
P4 3	94	REC-PB	○	NORMAL REC(L)/DUBBING, ETC(H)	
P4 4	95	R.DUBB	○	REC, DUBB(L)/ETC.(H)	
P4 5	96	PLAY-B	○	B DECK PLAY	
P4 6	97	P.MUTE	○	RECORD MUTE(H)	
P4 7	98	DOLBY	○	DOLBY B ON (L)/OFF(H)	
P5 0	99	L.MUTE	○	CD + DECK LINE MUTE(H)	
P5 1	100	CD-HI	○	CD HIGH SPEED DUBBING	

6-3. CD section

6-3-1. KA9220 (RF + SSP) : WIC01

Pin No.	Name	Description
1	AVEE(R)	Analog negative power supply input pin for RF part.
2	CPH	Capacitor connection pin of mirror hold.
3	CBH	Capacitor connection pin of defect bottom-hold
4	TESTD	Defect test pin
5	TESTM	Mirror test pin
6	Test1	Input pin for test
7	PFSET	Peak frequency setting pin for focus, tracking compensation and fc (cut off frequency) of CLV LPF
8	SSTOP	Check the position pin of pick-up whether inside or not.
9	DIRC	Direct 1 Track Jump Control Pin
10	AVCC	Analog positive power supply input pin for SERVO part.
11	WDCH	Auto-sequencer clock-input pin(Normal speed = 88.2KHz, Double speed=176.4KHz)
12	SMPD	Connection pin of DSP SMPD
13	SMON	Connection pin of DSP SMON, spindle servo ON at "H"
14	N/C	No connection pin
15	TGSW	Providing time constant to change the high frequency tracking gain
16	RTG	Capacitor connection pin to switch the tracking gain of high frequency
17	LFR	Capacitor connection pin to perform rising low bandwidth of focus servo loop
18	FSW	High frequency gain of focus servo loop can be changed by FS3 switch ON or OFF
19	HFGD	Reducing high frequency gain with capacitor connected between pin 18 and pin 19.
20	FSCH	Time constant external pin to generate focus search waveform
21	VREGI	External regulator voltage input pin for VCO
22	ISET	Ddterming the peak value of focus search,track jump and SLED kick
23	VREG	3.5V Regulator output pin
24	FVC	Pin connected external resistor to adjust free running frequency of VCO
25	SMEF	Providing an external LPF time constant of CLV SERVO Loop
26	BPF	Providing time constant for Loop filter of VCO
27	MCK	Clock input pin from μ-com
28	MLT	Latch input pin from μ-com
29	MDAT	Data input pin from μ-com
30	RESET	Reset input pin from μ-com, reset at "L"
31	LOCK	Pin for operation of the sled runaway prevention function at "L"
32	TRCNT	Track count output pin
33	ISTAT	Internal status output pin
34	AVEE	Analog negative power supply input pin for SERVO part
35	APDI	Input pin of DSP phase comparison output (PHAS)
36	F8M	Output pin of analog VCO Normal speedc= 8.64 MHz, Double speed = 17.28MHz
37	AASC	Auto-Asymmetry control input pin
38	EFMO	EFM Comparator output pin
39	SLEN	Non-inverting input pin of SLED SERVO amplifier
40	SLEO	Output pin of SLED SERVO amplifier
41	SLEI	Inverting input pin of SLED SERVO amplifer
42	TEST2	Test input pin to change speed mode Normal speed="H", Double speed="L"
43	SPDI	Inverting input pin of spindle servo amplifier
44	SPDLO	Spindle servo amplifier output pin
45	FCE	Invering input pin of focus servo complifier.
46	FSE0	Output pin of focus sevoe amplifier
47	TKEI	Non-inverting input pin of tracking servo amplifier
48	TKE0	Output pin of tracking servo amplifier
49	N/C	No connection
50	ATS	Anti-shock input pin

Pin No.	Name	Description
51	TZC	Tracking Zero Crossing input pin
52	TE2	Tracking Error Servo input pin
53	TE1	Output pin of tracking Error Amplifier
54	TDFCT	Capacitor Connection pin for Defect Compensation of tracking servo
55	DVCC	Digital positive power supply input pin for servo part
56	FE2	Focus error servo input pin
57	FE1	Output pin of focus error Amplifier
58	FDFCT	Capacitor connection pin for defect compensation of focus servo
59	FOK	Output pin of Focus ok comparator.
60	LDON	Laser diode ON/OFF control pin
61	EI	Feedback input pin of E I-V amplifier
62	EO	Output pin of E I-V amplifier
63	FBIAS	Bias pin of non-inverting input of focus error amplifier
64	DVEE	Digital negative power supply input pin for servo part
65	RFI	Output Signal of RF summing amplifier is inputed through capacitor
66	RFO	Output pin of RF summing amplifier
67	RF-	Inverting input pin of RF summing amplifier
68	RV	Output pin of (AVCC + AVEE)/2 Voltage
69	CV	Bias input pin of Center Voltage Buffer
70	LD	Output pin of APC amplifier
71	PD	Input pin of APC amplifier
72	AVCC	Analog positive power supply input pin for RF part
73	N/C	No connection
74	PD2	Inverting input pin of RF I-V AMP2
75	PD1	Inverting input pin of RF I-V AMP1
76	F	Inverting input pin of F I-V AMP
77	E	Inverting input pin of E I-V AMP
78	P/N	Selecting P-sub/N-sub of Laser diode
79	DCC2	Defect bottom-hold output is inputed through capacitor
80	DCC1	Output pin of defect bottom-hold

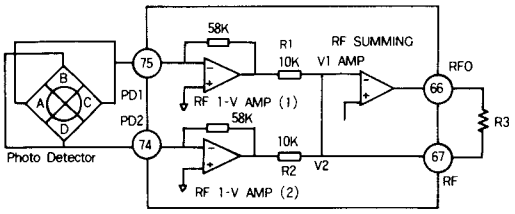
(2) KS9283 (Digital Signal Processor) : WIC02

Pin no.	Symbol	I/O	Description
1	AVDD 1		Analog Vcc1
2	DPDO	O	Charge pump output for master PLL
3	DPFIN	I	Filter input for master PLL
4	DPFOUT	O	Fiter output for master PLL
5	CNTVOL	I	VCO Control Voltage for master PLL
6	AVSS1		Analog Ground1
7	DATX	O	Digital audio output
8	XIN	I	X-tal oscillator input
9	XOUT	O	X-tal oscillator output
10	WDCH1	O	Word clock of 48 bit/SLOT
11	LRCH1	O	Channel clock of 48 bit/SLOT
12	ADTA1	O	Serial audio data output of 48 bit/SLOT(MSB first)
13	DVss1		Digital Ground1
14	BCK1	O	Audio data Bit clock for 48 bit/SLOT
15	C2PO	O	C2 pointer for output audio data
16	TIM2	O	Normal and Double Speed Control pin
17	/BCK1	O	Clock of BCK1
18	/BCK2	O	Clock of BCK2
19	BCK2	O	Audio data Bit clock of 64 Bit/SLOT
20	LRCH2	O	Channel clock of 64 Bit/SLOT
21	ADATA2	O	Serial audio data output of 64 Bit/SLOT(LSB First)
22	N.C		No connection
23	WDCH2	O	Word clock of 64 Bit/SLOT
24	EMPH	O	Emphasis/Non-Emphasis output ("H": Emphasis)
25	LKFS	O	The Lock status,output of frame Sync
26	SOS1	O	Output of subcode sync signal (S0 + S1)
27	RESET	O	System reset at "L"
28	SQEN	O	SQCK I/O Control("L": internal CK, "H": external CK)
29	SQCK	I/O	Clock for outpur subcode-Q data
30	SQDT	O	Serial output of subcode-Q data
31	SQOK	O	The CRC Check result signal output of subcode-Q
32	SBCK	I	Clock for output subcode-Q data
33	SDAT	O	Subcode Serial data output
34	DVDD		Digital Vcc1
35	MUTE	I	Mute control input ("H": Mute ON)
36	MLT	I	Latch signal input from Micom
37	MDAT	I	Serial clock input from Micom
38	MCK	I	Serial clock input from Micom
39	DB8	I/O	SRAM data I/O Port 8(MSB)
40	DB7	I/O	" 7
41	DB6	I/O	" 6
42	DB5	I/O	" 5
43	DB4	I/O	" 4
44	DB3	I/O	" 3
45	DB2	I/O	" 2
46	EB1	I/O	" 1 (LSB)
47	C1F1	I/O	Monitoring output for C1 error Correction (RA1)
48	C1F2	I/O	" (RA2)
49	C2F1	I/O	Monitoring outpur for C2 error Correction (RA3)
50	C2F2	I/O	" (RA4)

Pin no.	Symbol	I/O	Description
51	C2FL	I/O	C2 decoder flag (High: When the processing C2 code is impossible correction stage (RA5)
52	/PBCK	I/O	Output of VCO/2 (Normal speed = 4.3218MHz) (Double speed = 8.6436MHz(RA6)
53	DVSS2		Digital Ground 2
54	FSDW	I/O	Unprotected frame Sync(RA7)
55	ULKFS	I/O	Frame sync protection state (RA8)
56	/JIT	I/O	Display of either RAM overflow or under flow for ±4 frome Jitter margin (RA9)
57	C4M	I/O	Only Monitoring signal (Normal Playback: 4,2336MHz) (RA10)
58	C16M	I/O	16.9344MHz signal outpur(RA11)
59	/WE	I/O	Terminal for test
60	/CS	I/O	"
61	SEL1	I	Mode Selection Terminal 1(H: 33.8688MHz) (L: 16.9344MHz)
62	SEL2	I	" 2(H: APLL) (L: DPLL)
63	/SEL3	I	" 3(H: CDROM) (L: CDP)
64	/SEL4	I	" 4
65	TEST	I	Test Terminal(L: Normal operation state)
66	EFMI	I	EFM Siganl input
67	APDO1	O	Charge Pump output for analog PLL
68	/ISTAT	O	The internal status output
69	TRCNT	I	Tracking counter input signal
70	LOCK	O	output signal of LKFS condition sampled PBFR/16 (If LKFS is "H", Lock is "H". If the LKFS is sampled ":L" at least 8times by PBFR/16, Lock is "L")
71	PBFR	O	Write frame clock(Lock: 7.35KHz)
72	SMEF	O	LPF time constant control of the spindle servo error signal
73	SMON	O	ON/OFF control signal for spindle servo
74	DVDD2	O	Digital Vcc2
75	SMPD	O	Spindle Motor drive (Rough control in the CLV-S mode Phase control in the CLV-P mode)
76	SMSD	O	Spindle Motor drive (Velocity control int the CLV-P mode)
77	VC001	O	Vco output signal (When the state is Lock by means of PBFR it is 8.6435MHz)
78	VCOI1	I	VCO input signal
79	Dspeed	I	Double speed mode control (H: Normal speed) (L: Double speed)
80	APDO2	O	Analog PLL charge pump output for Double speed mode

6-4. CD section

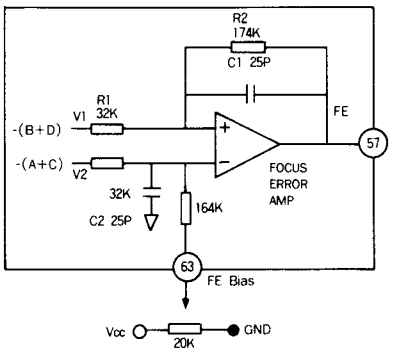
1) RF Amp (KA9220) : WIC01



RF I-V Amp (1) and RF I-V Amp (2) are converted to voltage via internal resistance of 58kΩ from the current of PD1 (A+C) and PD2 (B+D); then, this voltage is added to RFsumming amplifier.
The signal (A+B+C+D) is applied to RFO (No.2 terminal).
RF output voltage can be calculated as follows:

VRF = -R3 x (iPD1 + iPD2)
= -R3 x (V1/R1 + V2/R2)
= -R3 x (V1/10K + V2/10K)
= -R3/10K x (V1 + V2)

2) FOCUS ERROR Amp (KA9220) : WIC01



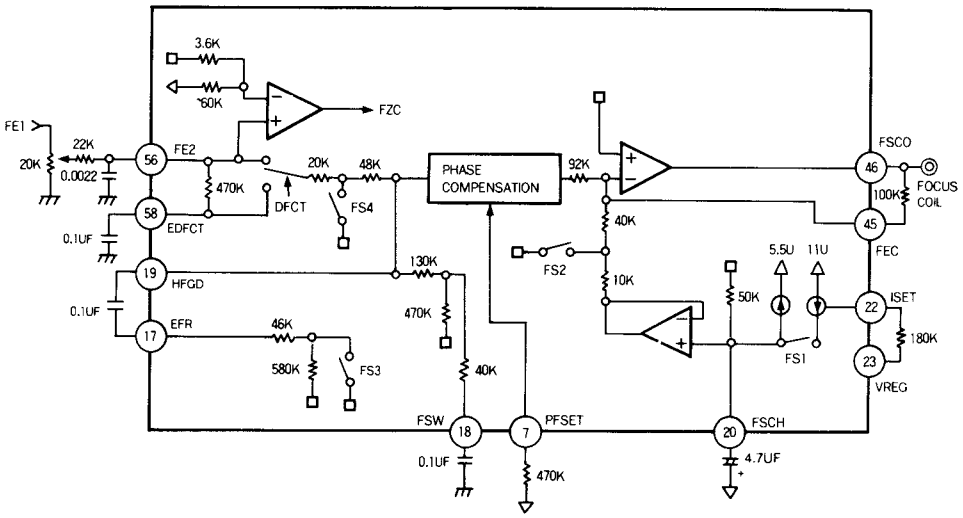
FOCUS ERROR Amp is the circuit which amplifies the difference between RF I-V Amp(1) output (A+C) and RF I-V Amp (2) output (B+D).
These two signals are supplied to (-) and (+) Input terminals of FOCUS ERROR Amp. The FOCUS ERROR signal resulting from this difference voltage is applied to FE (Terminal No. 57).
The FE output voltage of this low frequency component varies depending on {(A+C) - (B+D)}. VFE can be obtained as follows.

VFE = (R2/R1) x (V2 - V1) = 5.4(V2 - V1)

This FOCUS ERROR voltage is sent to FOCUS SERVO circuit to maintain optimum focusing.

3) FOCUS SERVO SYSTEM (KA9220) : WIC01

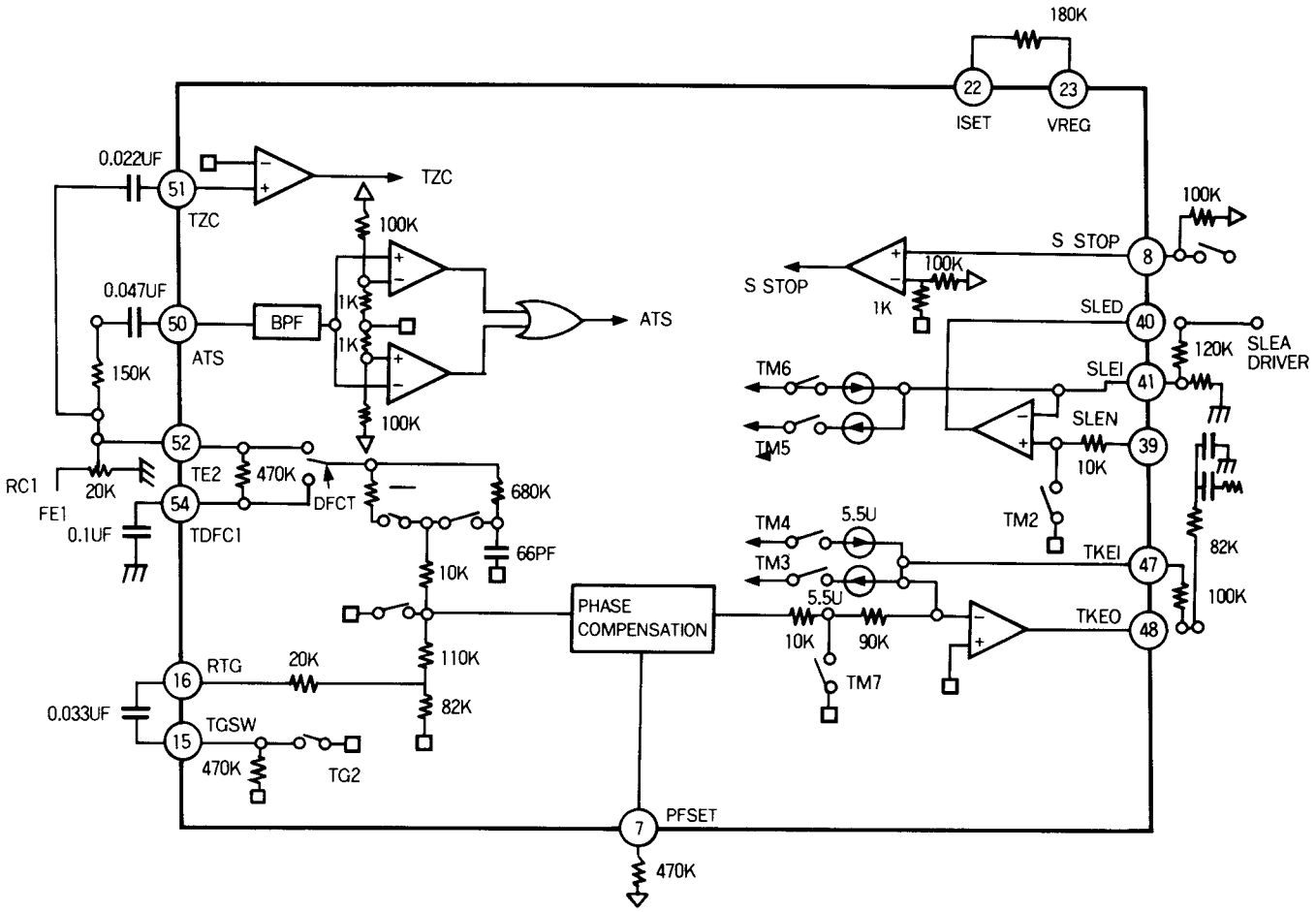
The diagram of Focus Servo System is shown in the following.
When FS3 is ON, high frequency gain decreases in the form of low frequency time constant by pin 17, pin 19, and capacitor connected to internal resistance.
The capacitor between pin 18 and GND has the time constant picking up the low frequency operated in PLAY mode.



The maximum frequency of focus phase compensation is inversely proportional to the resistance connected to pin 7.
Focus search peak is about 1.1 Vp-p, and is inversely proportional to the resistance connected to pin 22, 23; however, if this resistance changes, the peak of track jump and sled kick changes.
The inversion input of FZC comparator is set to 5.7% of the difference between Vcc and VC(pin 69) (5.7% x (Vcc - VC)).
Note: If the resistance connected to pin 7 changes, the phase compensation peak of focus, tracking, sled servo changes. At the same time, 'op-amp' dynamic range and offset voltage also change.

4) TRACKING SLED SERVO SYSTEM (KA9220) : WIC01

The diagram of Tracking Sled Servo System is shown in the following. The capacitor between pin 15 and 16 has a time constant, and lowers the high frequency when TG2 is off. The maximum frequency of tracking phase compensation is inversely proportional to the resistance connected to pin 7 (about 1.2 KHz at 470K). The tracking jump in the direction of FWD and REV is decided when TM3 and TM4 are ON, and the peak voltage induced from tracking coil is decided by the both TM3 and TM4 current values, and feed back resistance of pin 47.
Track jump max. voltage = TM3 (TM4) current x feedback resistance



FWD or REV sled kick is carried out when TM5 or TM6 is ON, and the peak voltage added to sled motor is decided by TM5 or TM current and the feedback resistance of pin 41.
Sled jump max. voltage = TM5 (TM6) current x feedback resistance
Each SW current is decided by the resistance connected to pin 22 and 23.
When the resistance is about 150 kΩ,

TM3 or TM4 = 11 μA;

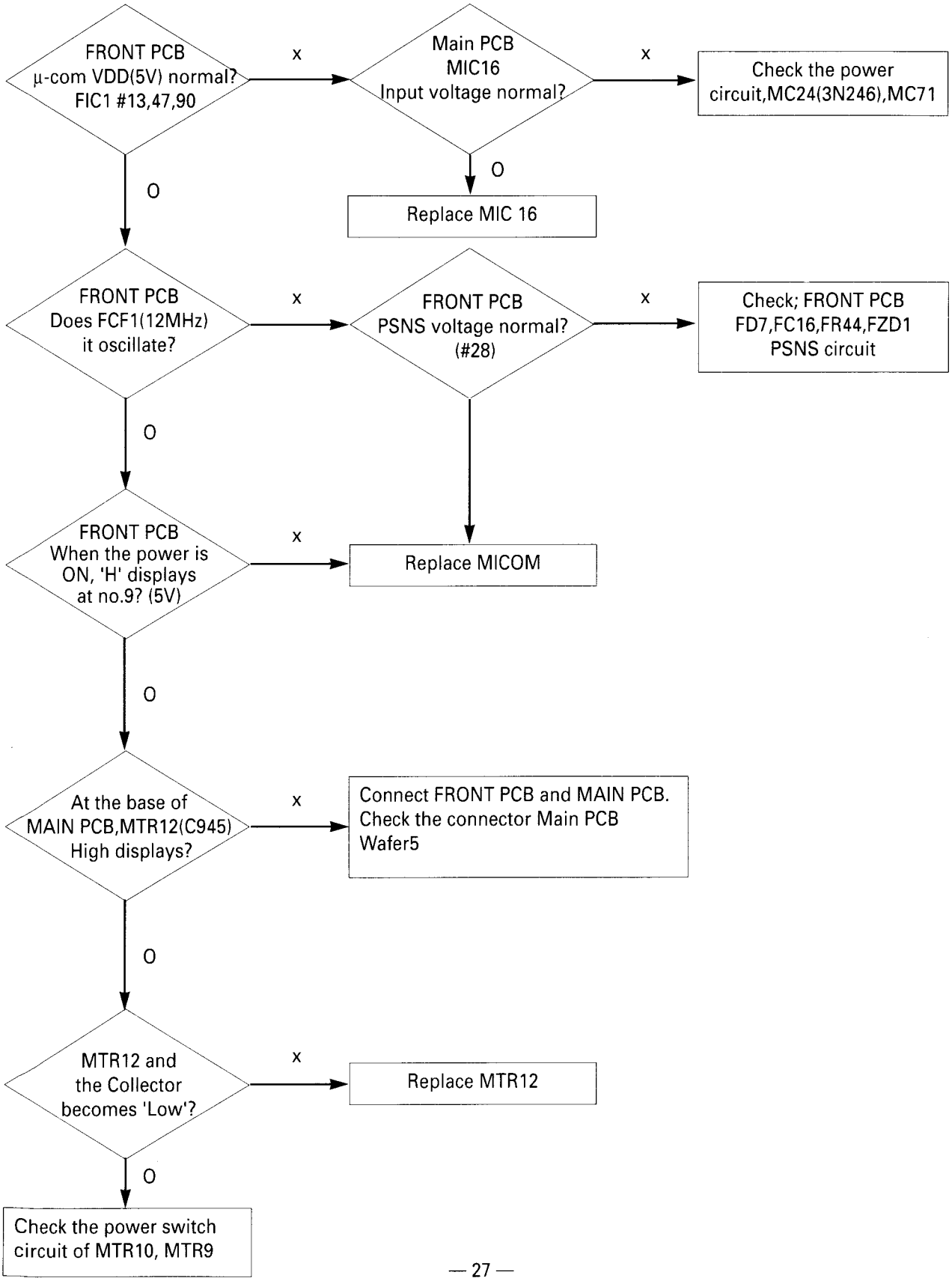
TM5 or TM6 = 22 μA.

This current is value is almost inversely proportional to the resistor,variable within a range of about 5 to 40 μA for TM3.
STOP is the ON/OFF detection signal for the limit SW or the sled motor's innermost circumference.

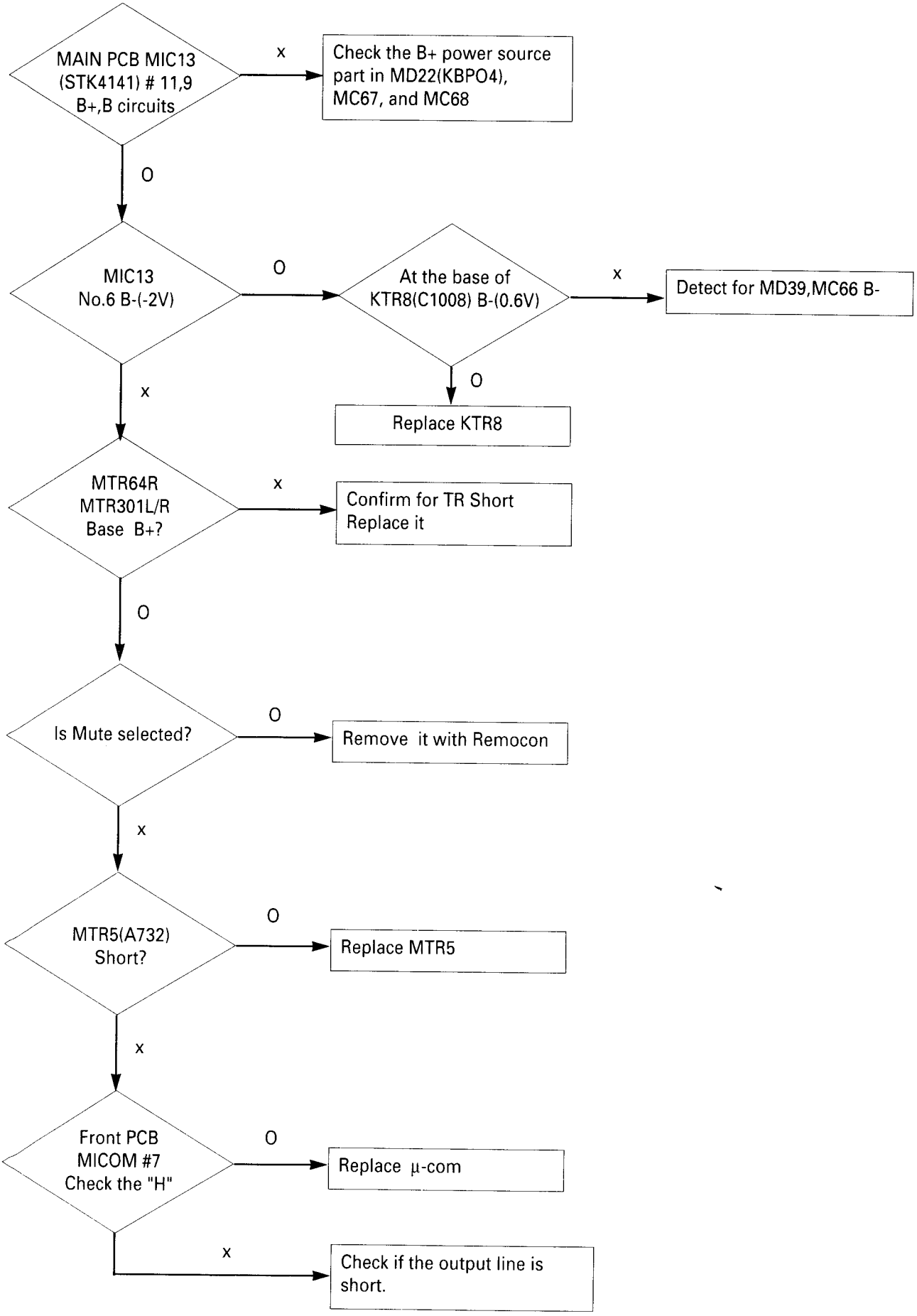
7. Troubleshooting

7-1. The Amplifier section

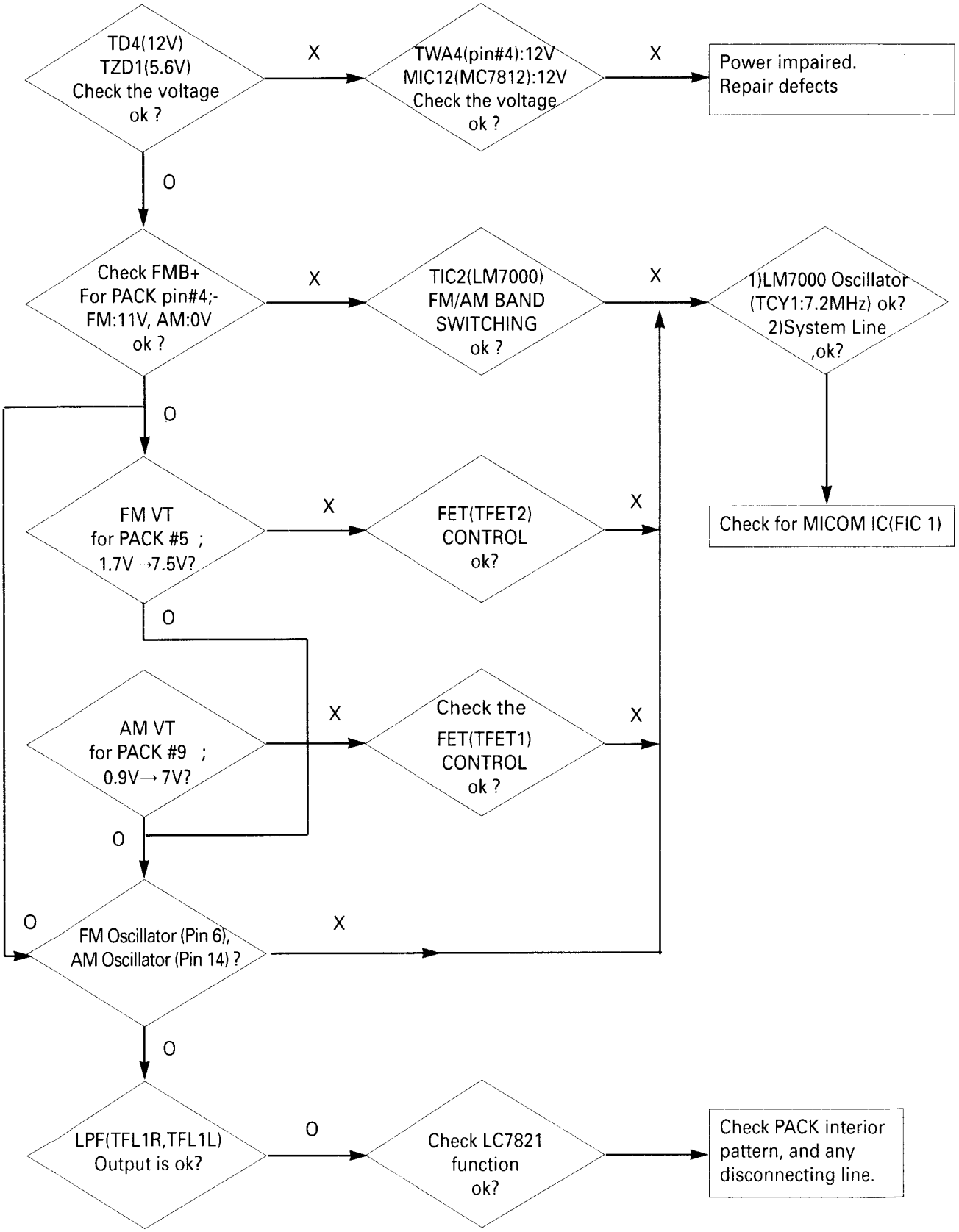
7-1-1. Power malfunction



7-1-2. No output

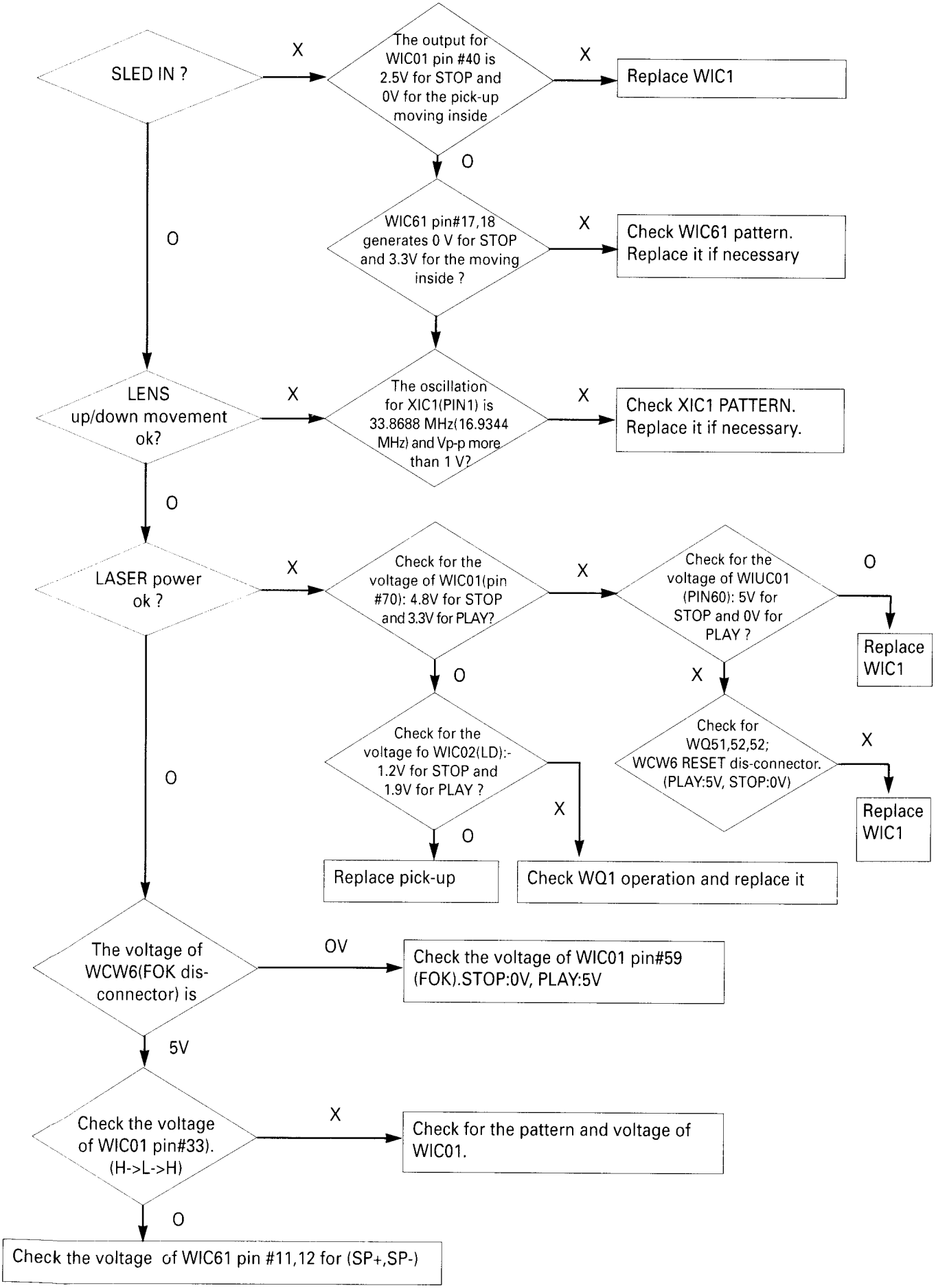


7-1-3. Tuner malfunction(FM/MW/LW)

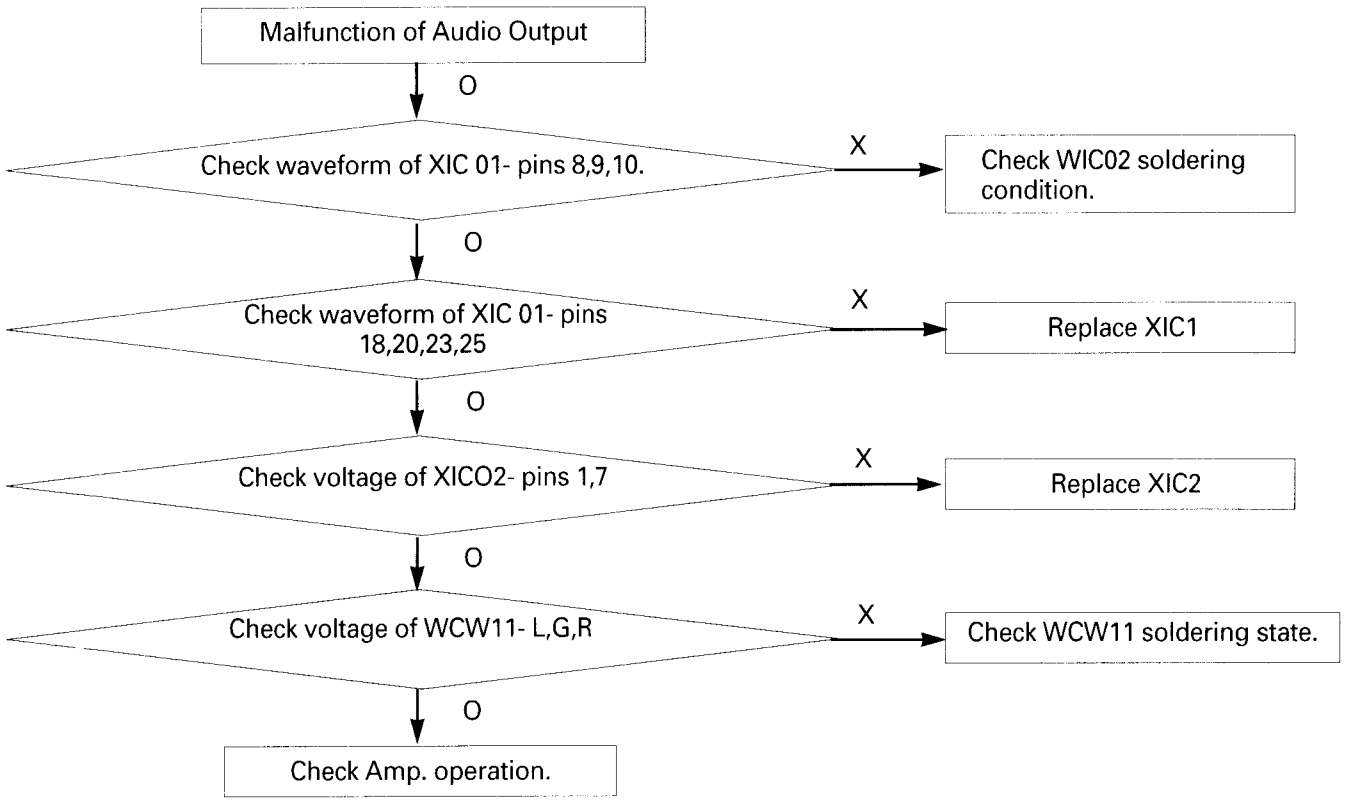


7-2. CD section

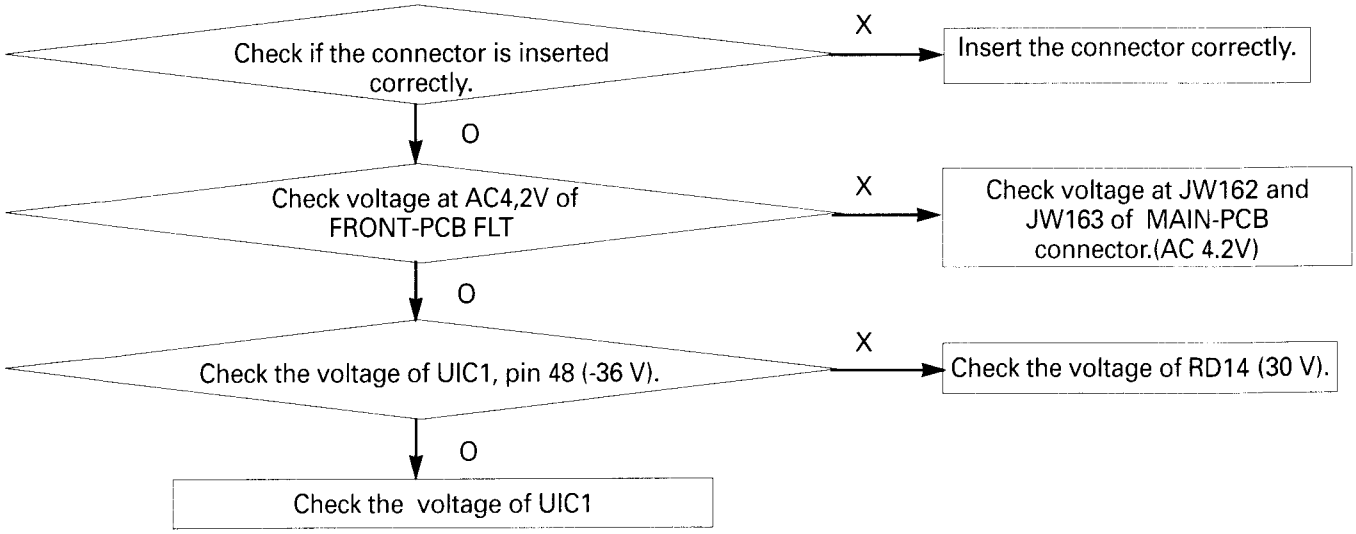
7-2-1. Malfunction in DISC circuit


SLED IN ?
X
The output for WIC01 pin #40 is 2.5V for STOP and 0V for the pick-up moving inside
X
Replace WIC1
O
O
WIC61 pin#17,18 generates 0 V for STOP and 3.3V for the moving inside ?
X
Check WIC61 pattern. Replace it if necessary
LENS up/down movement ok?
X
The oscillation for XIC1(PIN1) is 33.8688 MHz(16.9344 MHz) and Vp-p more than 1 V?
X
Check XIC1 PATTERN. Replace it if necessary.
O
LASER power ok ?
X
Check for the voltage of WIC01(pin #70): 4.8V for STOP and 3.3V for PLAY?
X
Check for the voltage of WIUC01 (PIN60): 5V for STOP and 0V for PLAY ?
O
Replace WIC1
O
X
Check for the voltage fo WIC02(LD):- 1.2V for STOP and 1.9V for PLAY ?
Check for WQ51,52,52; WCW6 RESET dis-connector. (PLAY:5V, STOP:0V)
X
Replace WIC1
X
O
Replace pick-up
Check WQ1 operation and replace it
O
The voltage of WCW6(FOK dis-connector) is
OV
Check the voltage of WIC01 pin#59 (FOK).STOP:0V, PLAY:5V
5V
Check the voltage of WIC01 pin#33). (H->L->H)
X
Check for the pattern and voltage of WIC01.
O
Check the voltage of WIC61 pin #11,12 for (SP+,SP-)

7-2-2. Malfunction of Audio Output



7-2-3. F.L.T. Malfunction


Check if the connector is inserted correctly.
X
Insert the connector correctly.
O
Check voltage at AC4,2V of FRONT-PCB FLT
X
Check voltage at JW162 and JW163 of MAIN-PCB connector.(AC 4.2V)
O
Check the voltage of UIC1, pin 48 (-36 V).
X
Check the voltage of RD14 (30 V).
O
Check the voltage of UIC1

7-3. CASSETTE DECK section

7-3-1. Troubleshooting chart

<table>
<tr><th>BLOCK</th><th>Main FUNCTION</th><th>CHECK POINT</th></tr>
<tr><td>TAPE IC KIC1
(KA22292Q)</td><td>● Conver of P/B & R/P SIGNAL
& DECK Output of IC</td><td>● Check for voltage at PIN 27
1 P/B deck ; H
2 R/P deck ; L
● Check for voltage at PIN 28
1 P/B deck ; L
2 R/P deck ; H</td></tr>
<tr><td>AMPS
KIC2(LA2010)</td><td>● AMPS & REPEAT</td><td>● Check for voltage at PIN6
When between songs : Low(Normal)
When playing song : High(Normal)
● Check for signal presence at PIN 1.</td></tr>
<tr><td rowspan="2">DOLBY NR AMP
DIC1(KA2271)</td><td>● Convert P/B & SOURCE SIGNAL</td><td>● Check for voltage at PIN 4
P/B mode ; High
R/P mode ; Low
DUBBING mode ; High
● When in operative UIC1 98PIN CHECK
<table><tr><th>Mode</th><th>UIC 1 98 PIN</th></tr><tr><td>P/B mode</td><td>H</td></tr><tr><td>R/P mode</td><td>L</td></tr><tr><td>DUBBING</td><td>H</td></tr></table></td></tr>
<tr><td>● Convert DOLBY NR ON/OFF</td><td>● DIC1 13 CHECK
<table><tr><th>Mode</th><th>UIC1 98 PIN</th></tr><tr><td>OFF</td><td>H</td></tr><tr><td>ON</td><td>L</td></tr></table></td></tr>
<tr><td>BIAS OSC</td><td>● Oscillate RECORD BIAS
(106 kHz)</td><td>● TPWF3 CHECK
Osc Frequency ; 106KHz
● When inoperative ; LO4, LQ3 CHECK</td></tr>
<tr><td>R/P SWITCHING</td><td>● Convert PLAY/RECORD HEAD</td><td>● LQ5L, LQ5R, Gate Check
<table><tr><th>Mode</th><th>LQ5L,R</th></tr><tr><td>REC</td><td>-10V</td></tr><tr><td>PLAY</td><td>0V</td></tr></table></td></tr>
<tr><td>μ-COM UIC1</td><td>● Control DECK MECHA
● Control LCD DISPLAY
● Control MUTE circuit
● Control each circuit</td><td>● Check for RESET
When power is turned ON.</td></tr>
<tr><td>FL DISPLAY
UIC1</td><td>● Drive FL DISPLAY</td><td>● Check UWF1</td></tr>
</table>

7-3-2. Troubleshooting

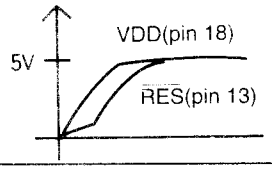
(1) DECK OPERATE PROBLEM

POWER CHECK

- Check power
- Check voltage RQ2, RQ7
  RQ2 INPUT : 13V
  RQ7 INPUT : 21V
  OUTPUT : 13V
  OUTPUT : 12V

↓

μ-COM RESET CHECK (UIC1)



↓

MOTOROPERATE & SOLENOID CHECK

FUNCTION	CQ6	CQ1	CQ3
OPERATION P/B DECK	Turn-on	⊓	
OPERATION DECK R/P	Turn-on		⊓

↓

CHECK DECK CONNECTOR WIRE

- Check connection of 11pin connecting wire
  Check connection of 13 pin connecting wire

(2) HIGH-SPEED DUBBING PROBLEM

μ-COM & TR CHECK

STEP	CONDITION \ FUNTION	Hi/DUBBING	NOR/DUBBING
1	PIN 80 of μ-COM	H	L
2	CQ10	Turn on	Turn off
3	CQ9	Turn off	Turn on

(3) RECORDING PROBLEM

μ-COM & TR CHECK

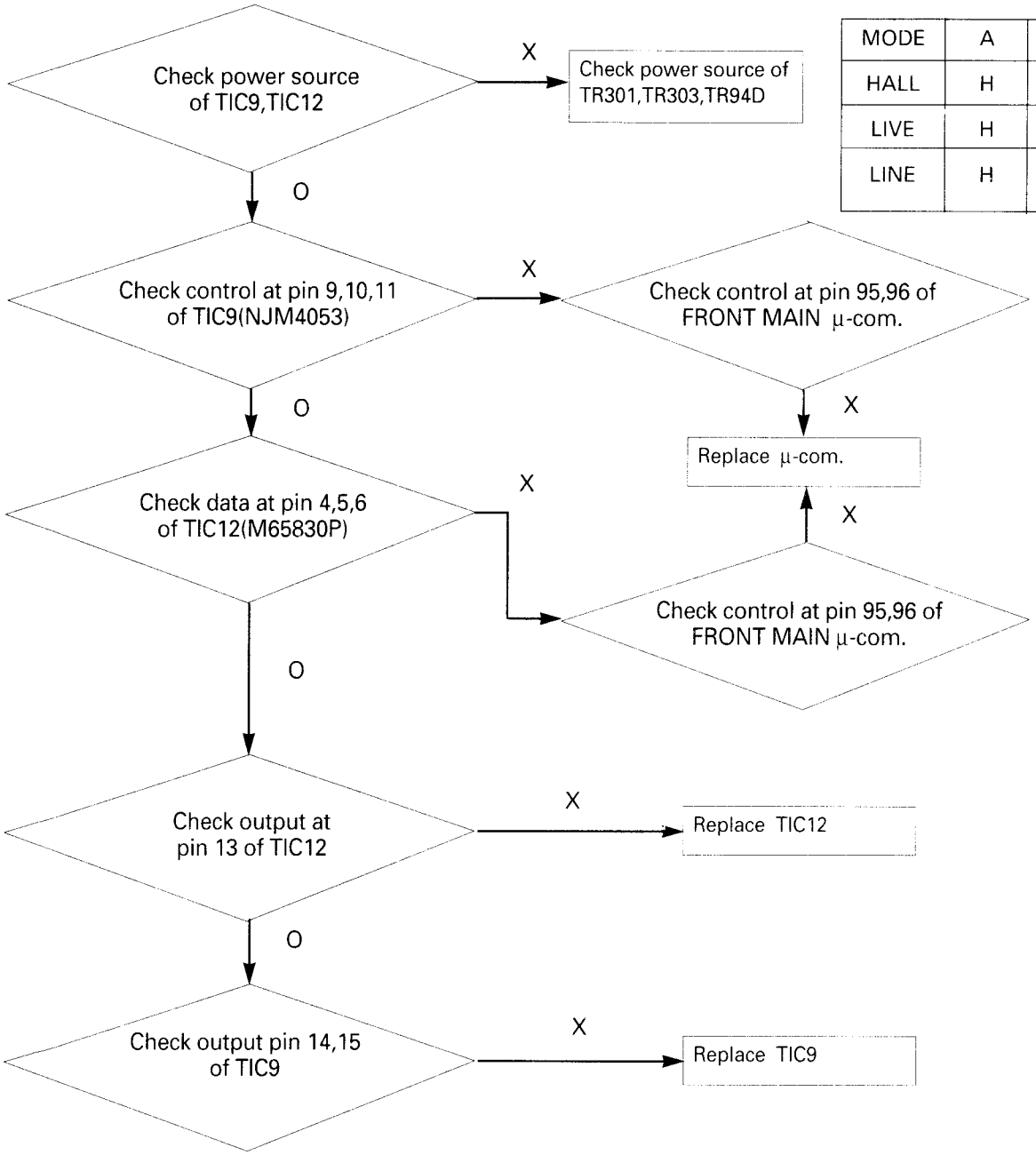
STEP	CONDITION \ FUNCTION	REC
1	PIC 95 of μ-COM	L
2	LQ1	Turn-ON
3	LQ2	Turn-off
4	PIN 28 of KIC1	6V
5	LC2(473)	-10V

(4) DUBBING PROBLEM

μ-COM & TR CHECK

STEP	CONDITION \ FUNCTION	REC
1	JQ44L, 44R	Turn on
2	PIN 4 of DIC1	H
3	PIN94 of VIC1	H
4	KQ2L, 2R	Turn on

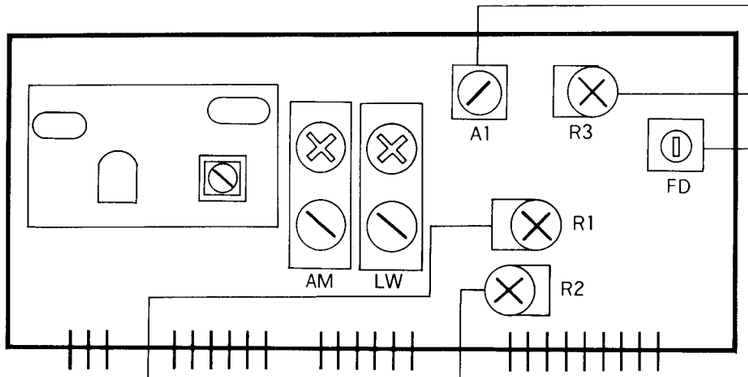
(5) DSP problem



MODE	A	B	C
HALL	H	H	L
LIVE	H	H	H
LINE	H	H	L

8. Adjustment

8-1. TUNER Section(PACK)



AM STEREO Adjustment	
SSG FREQ.	1008 KHz
Adjustment point	AM IF coil
L-CH/R-CH : Maximum(Fig. 5)	

AM Search Level Adjustment	
SSG FREQ.	1008KHz
Adjustment point	SEMI-VR(50KB)
"TUNED" is shown on FLT (Fig.3)	

FM T.H.D Adjustment	
SSG FREQ.	98.1MHz
Adjustment point	FM DETECTOR COIL
Minimum output (Fig.1)	

FM Search Level Adjustment	
SSG FREQ.	98.1MHz
Adjustment point	SEMI-VR(50KB)
"TUNER" is shown on FLT (Fig.4)	

FM STEREO Adjustment	
SSG FREQ	98.1MHz
Adjustment point	SEMI-VR(5KB)
L-CH/R.CH : Maximum(Fig. 2)	

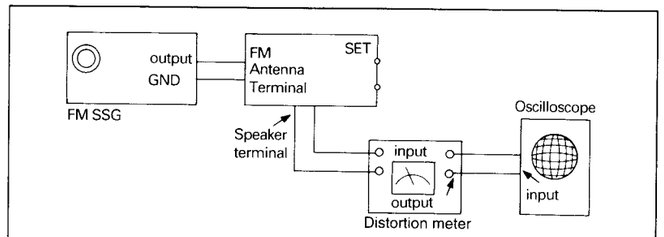


Fig.1) IF Center & T.H.D Adjustment

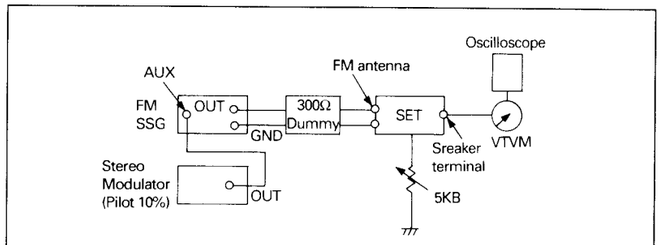


FIG.2) FM STEREO separation Adjustment

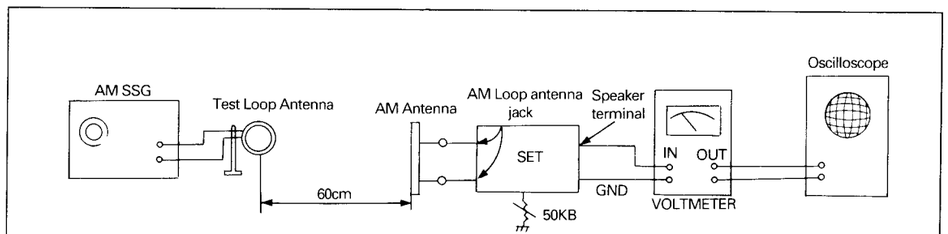


Fig. 3) AM Tracking Adjustment

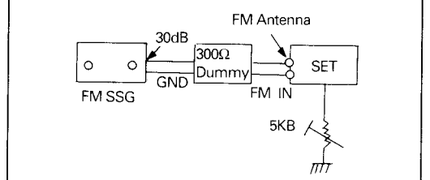
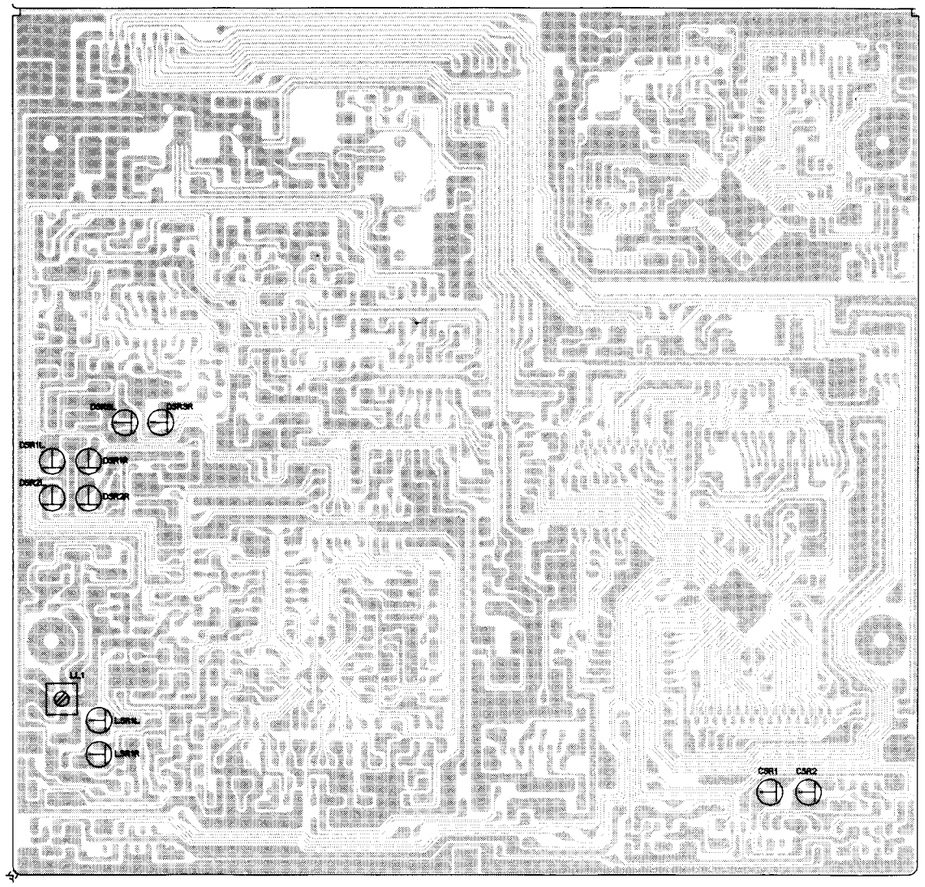


Fig.4) FM Auto search Level Adjustment

8-2. Cassette deck section

8-2-1. The diagram of the adjustable locations



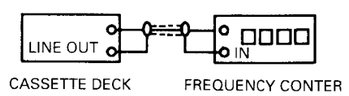
8-2-2. The order of the adjusting process

(1) To adjust tape speed

Caution

1) The measuring tape : i)MTT-111 (or equivalent)
(Tapes recorded with 3KHz)
ii)MTT-5521 (or equivalent)

2) The cassette deck is connected to the measuring instrument as in the FIG. 1



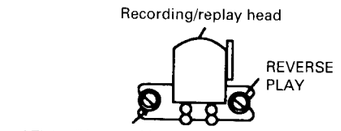
(FIG. 1)

STEP	ITEM	PRE-SETUP CONDITION	PRE-SETUPS	TO ADJUST	STANDARD	REMARKS
1	NOR SPEED Control	OUT is connected to the frequency	1) 1-Deck:MTT-111 2) Press PLAY button 3) 2-Deck:Same as below	1) Turn CSR1 to left and right.	3KHz ±1%	
2	HI SPEED Control	same as above	1) 1-Deck:MTT-111 2) 2-Deck:MTT-5521 3) Press HI SPEED dubbing switch	1) Turn CSR2 to left and right	6KHz±1%	

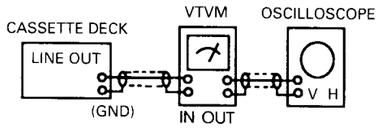
(2) To adjust replay level

Caution

1) Before the actual adjustment, clean the replay/recording head.
2) The measuring tape has to be;
i) MTT-114NA (or equivalent one: For the use of 12.5KHZ AZIMUTH control)
ii) MTT-150 (or equivalent one: tapes recorded with Dolbye evel. 200mwb/m)
3) Dolbye NR SW OFF
4) The cassette deck is connected to the measuring instruments as shown in the FIG. 3



(FIG.2)



(FIG.3)

① To adjust A-deck replay level

STEP	ITEM	PRE-SETUP CONDITION	PRE-SETUPS	TO ADJUST	STANDARD	REMARKS
1	AZIMUTH REPLAY LEVEL	• AMP SPK OUT is connected to the scope.	After putting MTT 114 NA into Deck1. 1) Press FWD PLAY button. 2) Open the door of the deck, and with a control stick, push the CAP-AZIMUTH's two hooks.	1) Turn the control knob to left and right as shown in the FIG. 3	Max output and same phase both channels	After it is adjusted, fix it with REGION LOCK. • Assemble CAPAZJ,B
2	PLAYBACK LEVEL	• Connected to the VTVM and scope.	PLAY MTT-150 in the Deck1.	L-CH: DSR2L R-CH: Turn DSR2R to the right and left.	170mV ±. 0.5dB	See the Diagram for the adjustable loacations.

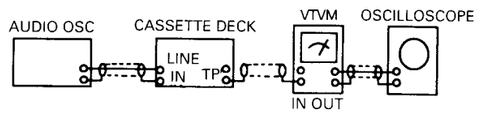
② To adjust B-deck replay level

STEP	ITEM	PRE-SETUP CONDITION	PRE-SETUPS	TO ADJUST	STANDARD	REMARKS
1	AZIMUTH	• OUT is connected to the scope.	After putting MTT114 NA into Deck2 1) Press FWD PLAY button. 2) Press REV PLAY button.(Open '2' deck door and adjust CAP-AZ)	1) Turn the control knob to left and right as shown in the FIG. 3	Max output and same phase both channels	After it is adjustment is done, fix it with REGION LOCK. • Assemble CAPAZIB.
2	PLAYBACK LEVEL	• Connected to the VTVM and scope.	Replay MTT-150 in the Deck2.	L-CH: DSR2L R-CH: DSR1R to the right and left.	170mV ±. 0.5dB	See the Diagram for the adjustable loacations

③ To adjust recording or replay

Caution

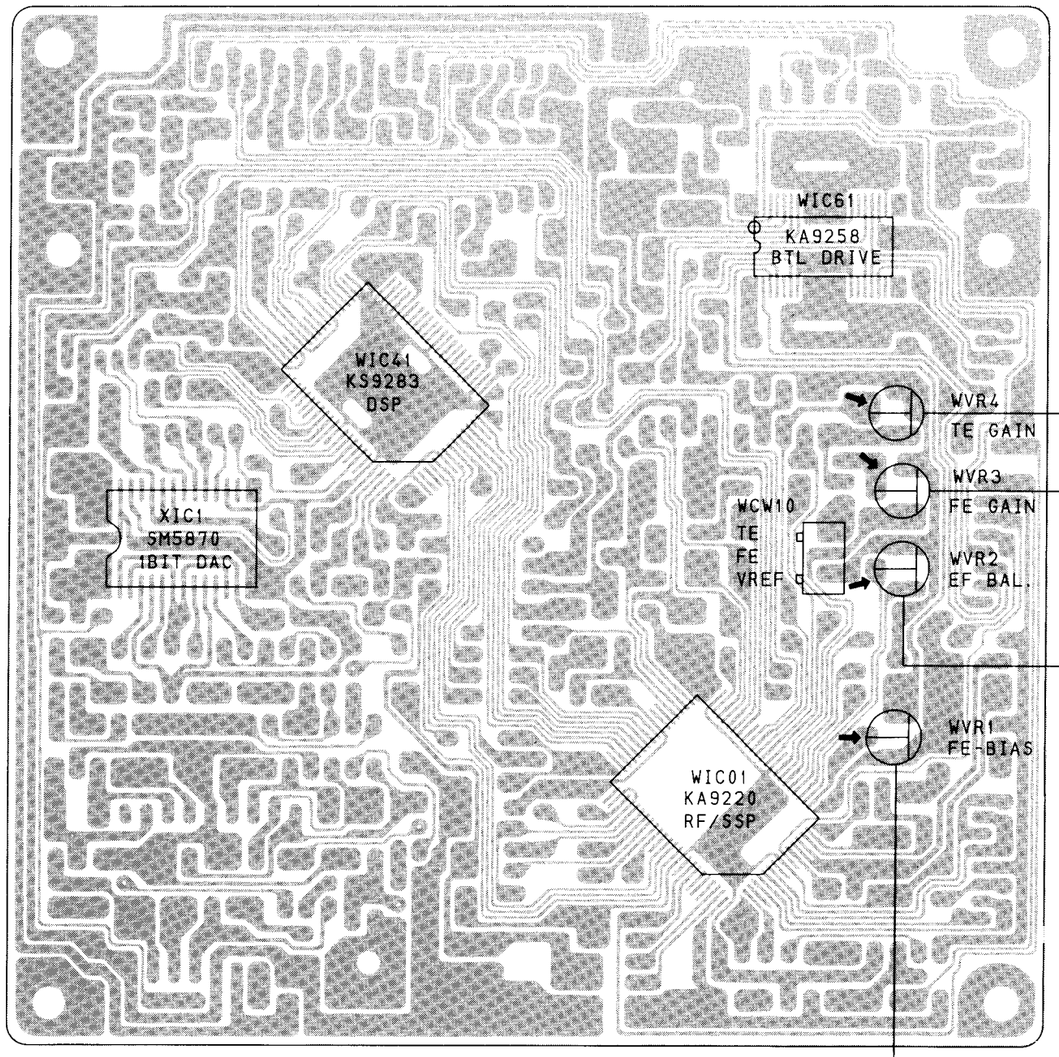
1) Connect to the measuring instruments as shown in FIG 4.
2) Set the DOLBI NR switch off.
3) For the measuring tape;
i) MTT-5521(or equivalent; for normal recording.)
ii) MTT-5561(or equivalent; for CrO2 recording)
4) The input signals supplies 400Hz 300mV into AUX IN of AMP as AUDIO OSC.



(FIG .4)

STEP	ITEM	PRE-SETUP CONDITION	PRE-SETUPS	TO ADJUST	STANDARD	REMARKS
1	Normal electric currancy for recording	Connect to TPWF2 as in FIG 4 and read UTVM scale.	After placing MTT-1 into DECK1 and MTT-2 into DECK-2 press COPY button	Turn each DSR3L(L-CH) and DSR3R(R-CH) to right and left.	TVM01 120mV ±.5%	See the Diagram for the adjustable locations
2	BIAS OSCILLATOR FREQUENCY	Connect the frequency counter to TPWF3	Place MTT-5521 into deck 2. Then press REC button.	Turn the BIAS oscillator frequency coil, LL1, to right and left.	as given (106KHz ± 5%)	See the Diagram for the adjustable locations
3	BIAS electric currency	Connect to TPWF3 as in picture 4 and read the scale of VTVM	Place MTT-5521 into deck 2. Then press REC button	L-CH: LSR1L R-CH: LSR1R DSRIR to the right and left.	as given by VTVM(7V ± 5%)	See the Diagram for the adjustable locations

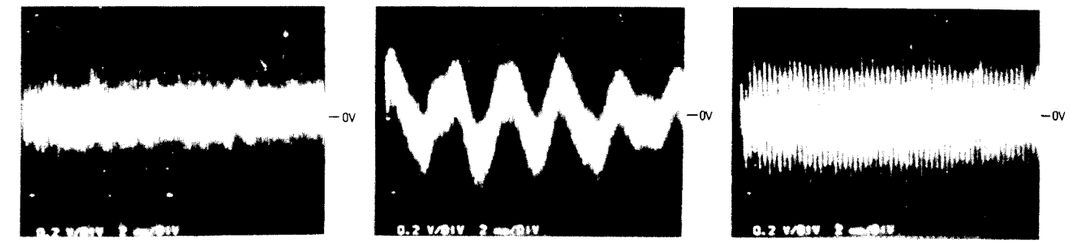
8-3. CD section



8-3-4. To adjust TRACKING GAIN (PLAY mode)

1) Connect;GND disconnector of the oscilloscope to VR of WCW10 and (+)disconnector to VREF of WCW10.
2) Load and play the disc.
3) While the disc is running adjust the gain with WVR4 as shown in the following picture.

(Normal freqency) (Low frequency) (High frequency)



VOLT/DIV: 0.2V
TIME/DIV: 2mS

VOLT/DIV: 0.2V
TIME/DIV: 2mS

VOLT/DIV:0.2V
TIME/DIV:2mS

8-3-3. To adjust FOCUS GAIN (PLAY mode)

1) Connect;GND disconnector of the oscilloscope to VR of WCW10 and (+)disconnector to VREF of WCW10.
2) Load and play the disc.
3) While the disc is running adjust the gain with WVR3 as shown in the following picture.

(Normal freqency) (Low frequency) (High frequency)

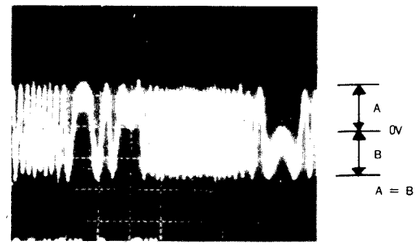
VOLT/DIV: 0V
TIME/DIV: 2mS

VOLT/DIV: 0.1V
TIME/DIV: 2mS

VOLT/DIV:0.1V
TIME/DIV:2mS

8-3-2. To adjust E/F BALANCE (PLAY mode)

1) Set TIME/DIV of the oscilloscope at 2mS.
2) Set Volt/DIV of the oscilloscope at 0.5V.
3) At GND setting of the oscilloscope set the wave form at 0v and then set it in the DC range.
4) Connect;GND disconnector of the oscilloscope to VREF of WCW10 and (+)disconnector to VREF of WCW10.
5) Load and play the disc.
6) Turn WVR4 clockwise to the minimum value.
7) Raise WVR2 and adjust the wave form so that the middle of wave comes to the GND of the oscilloscope or until the upper half of wave form becomes symmetrical to the buttom half. (A=B)
8) Adjust WVR4 in the arrow direction to achieve a normal sound effect.

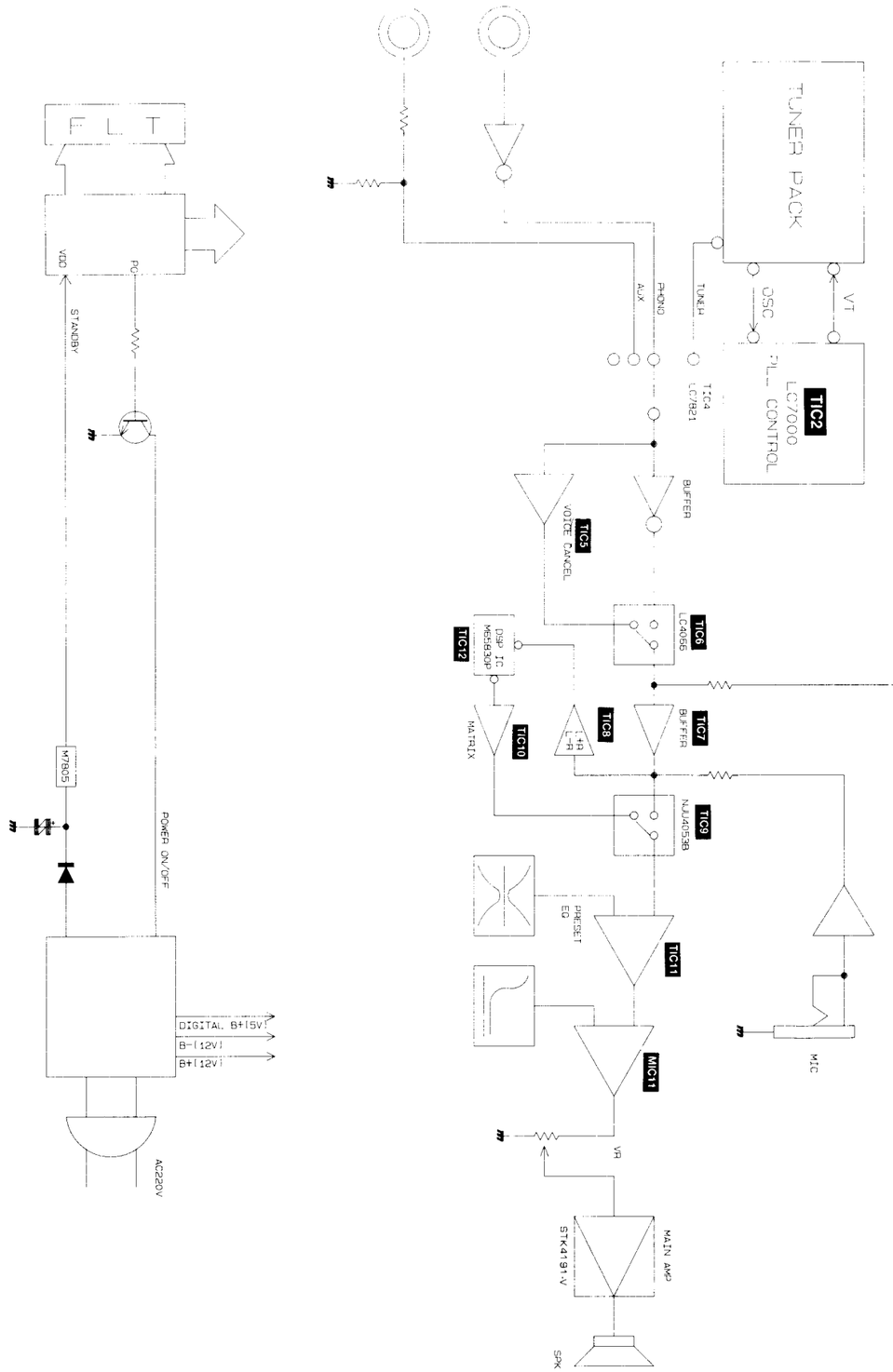


8-3-1. To adjust FOCUS BIAS (STOP mode)

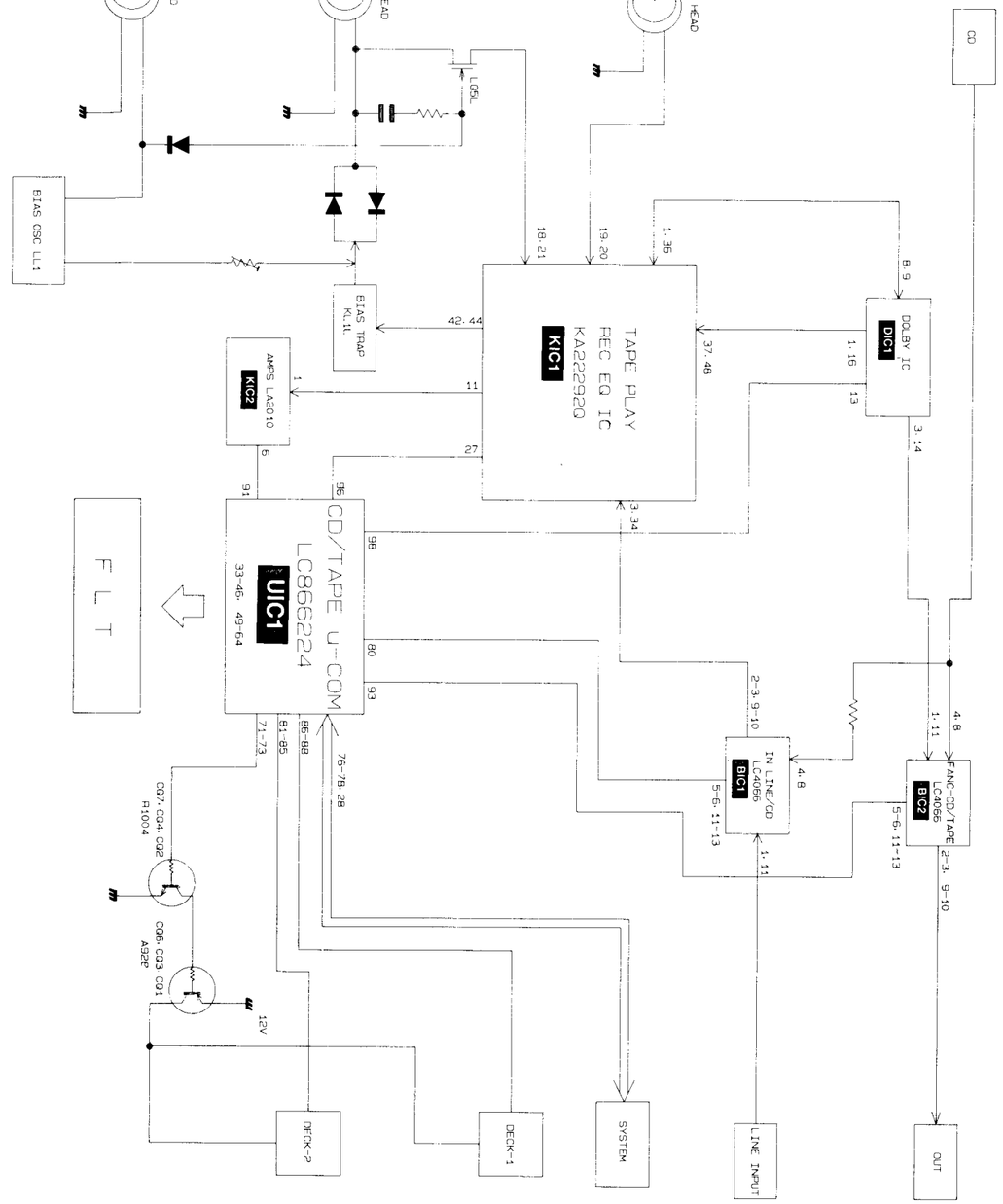
1) Set Volt/Div of the oscilloscope at DC 100mV.
2) In GND condition of the oscilloscope, set the wave form at 0V, and then set it in the DC range.
3) Connect the GND disconnector of the oscilloscope at VREF of WCW10, and (+) disconnector to FE of WCW10.
4) By using WVR1 set it at 0mV.

9. Block diagram

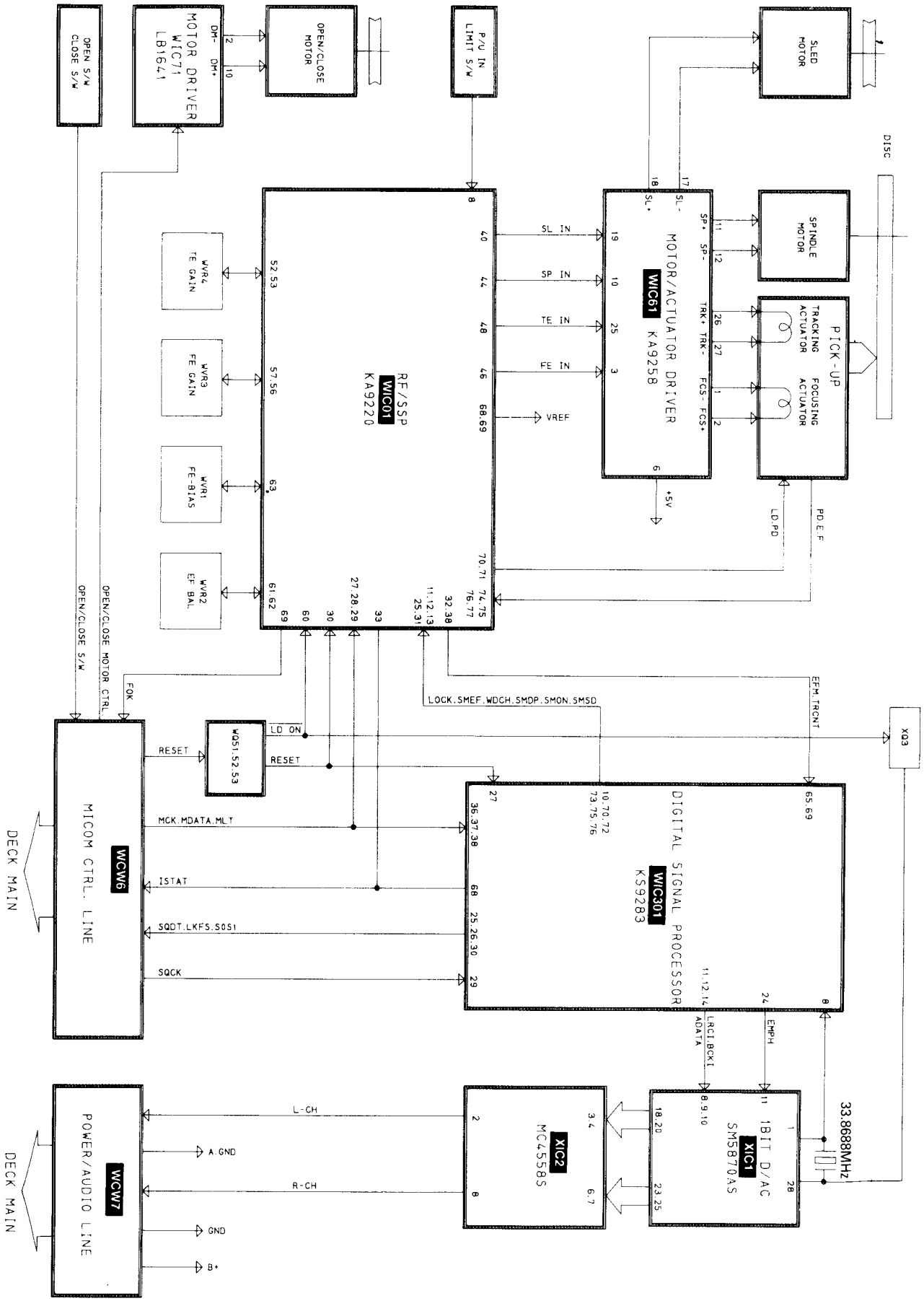
9-1. Amp & Tuner section



9-2. Cassette deck section



9-3. CD section



10.Exploded view & parts list

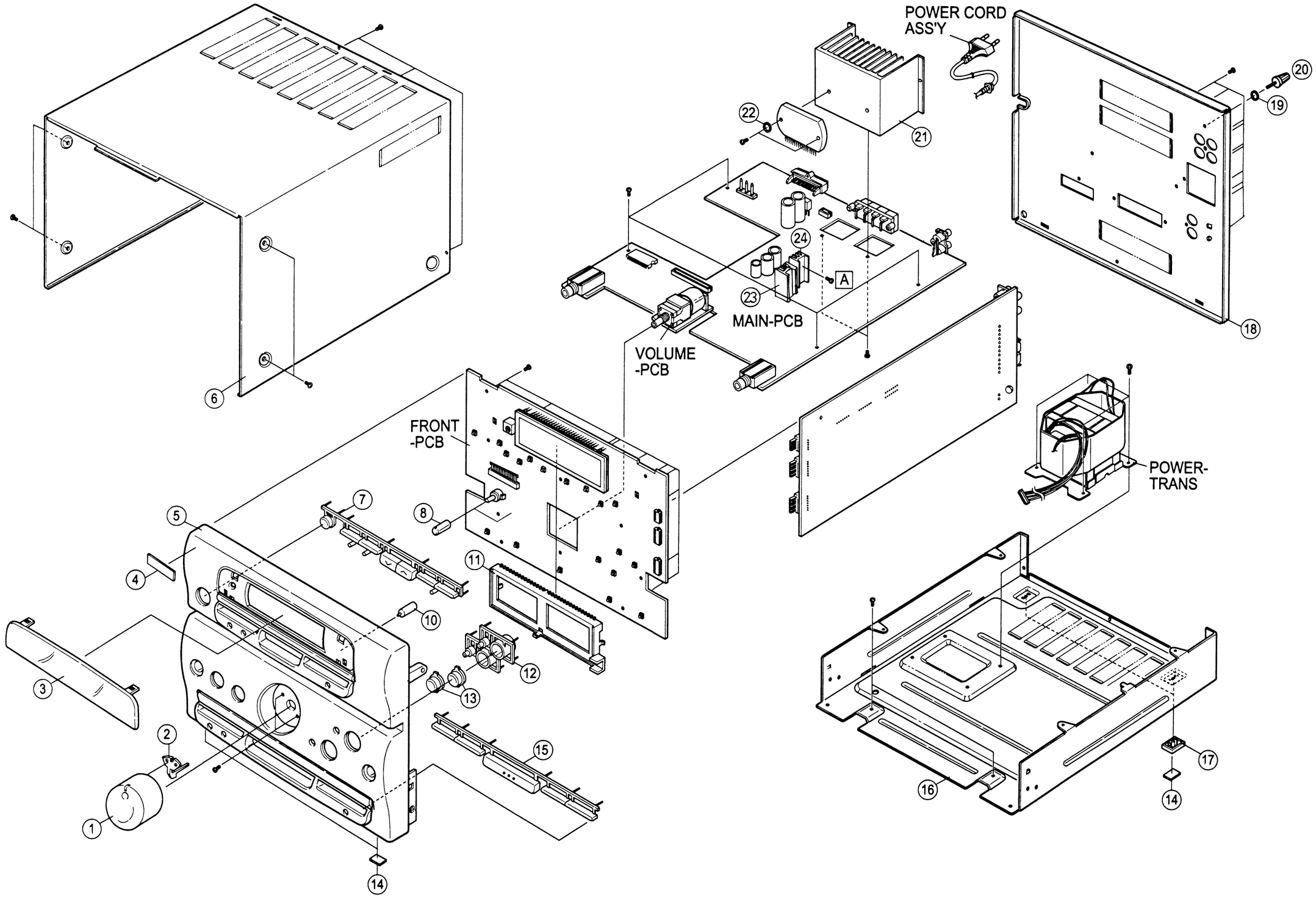
10-1. Amp & tuner section(MAX-485R)

10-1-1. PARTS LIST

● Exclusiveness part

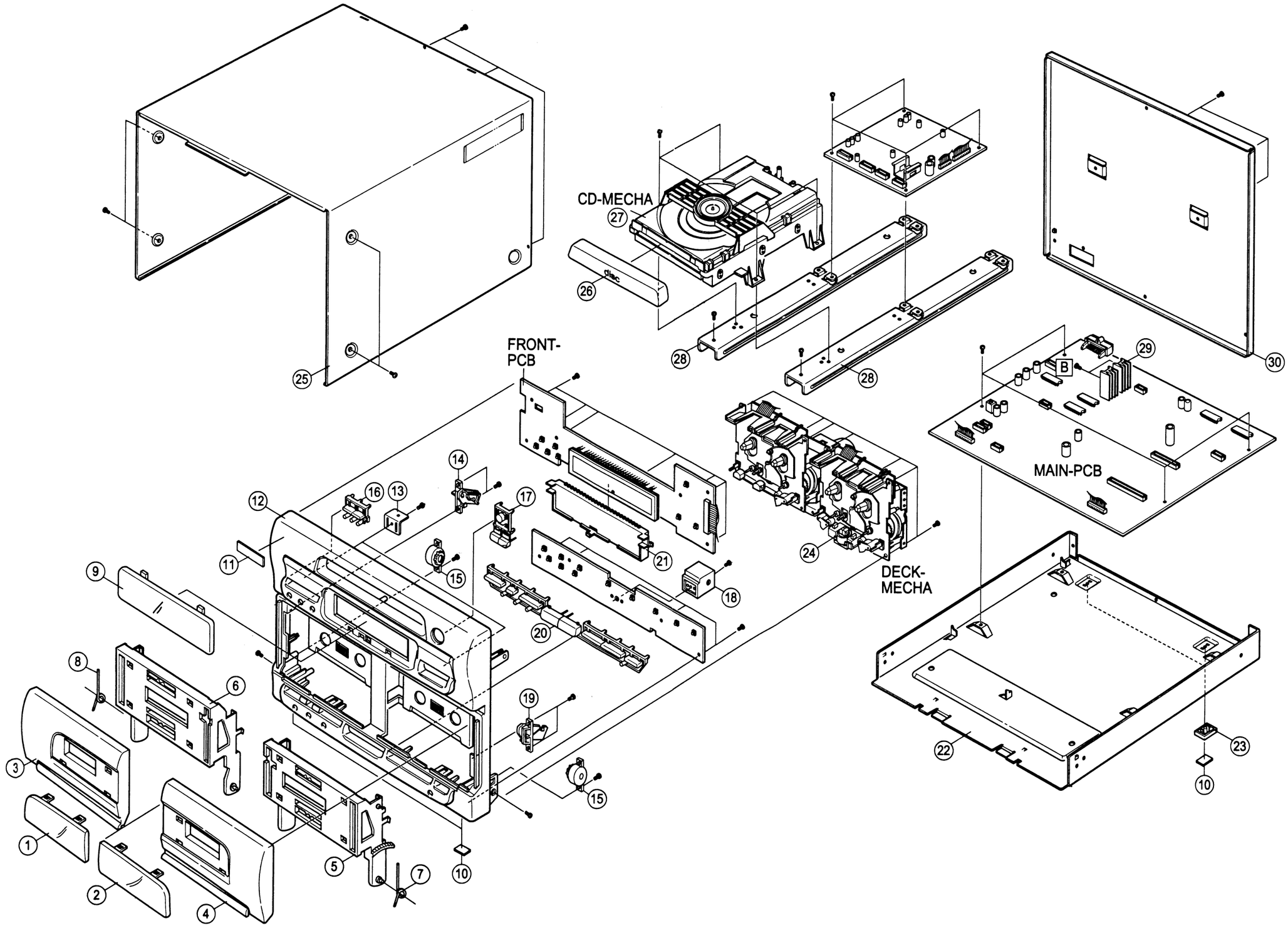
No.	Code no.	Description	Specification	Q,TY	REMARK
1	14084-0475-00	KNOB-VOLUME	ABS 94HB	1	
2	12714-0042-00	LENS-VOLUME	MQ-485R PMMA	1	
3	14073-0192-02	WINDOW - FL	MQ485R T3.0 VIOLET PMMA EXP	1	
4	A0120-0200	BADGE- BRAND	L27 20 D20XD1.5 L5XL0.9	1	
5	12000-0185-02	CABINET-FRONT	MQ485R T2.5 BLK ABS DOM	1	
6	12002-0186-05	CABINET-TOP	MAX485R V/STEEL T0.75 BLK	1	●
7	14083-0459-02	KNOB-TUNER	MQ485R BLK ABS	1	
8	14084-0463-00	KNOB-BALANCE	MQ485R BLK ABS	2	
10	12714-0043-00	LENS-MODE	MQ485R PMMA	1	
11	13322-0126-00	HOLDER-FL	MQ485R T1.5 BLK ABS	1	
12	14083-0461-00	KNOB-DSP	MQ485R BLK ABS	1	
13	12714-0041-00	LENS-DSP	MQ485R PMMA TI02	2	
14	13054-0044-00	CUSHION-FOOT	MQ570A T2.0	4	
15	14083-0460-00	KNOB-FUNCTION	MQ485R BLK ABS	1	
16	12001-0188-00	CABINET-BOTTOM	MQ485R T1.0	1	
17	13004-0007-00	FOOT	MQ570A BLK ABS	2	
18	12002-0187-02	CABINET-REAR	MAX485R T0.8 SECC EXP	1	
19	17304-500-210	WASHER PLAIN	4.5PT X 10PT X 1.0T SPC1 F	1	
20	13104-501-630	TERMINAL-SCREW	SPC1+ABS BLK V	1	
21	11123-0043-00	HEAT-SINK	MQ485R AL EXTR	1	
22	16854-100-610	SPACER-RING	P18 X PT3.2 X 1T FIBER	1	
23	15684-507-510	HEAT-SINK,S	AL, EXTR WHT 40H	1	
24	15684-507-530	HEAT-SINK,S	AL, EXTR WHT 40H	1	

10-1-2. Exploded view (MAX-485R)



10-2. Cassette deck & CD section (MAX-485Z)

10-2-1. Exploded view



10-2-2. Parts list

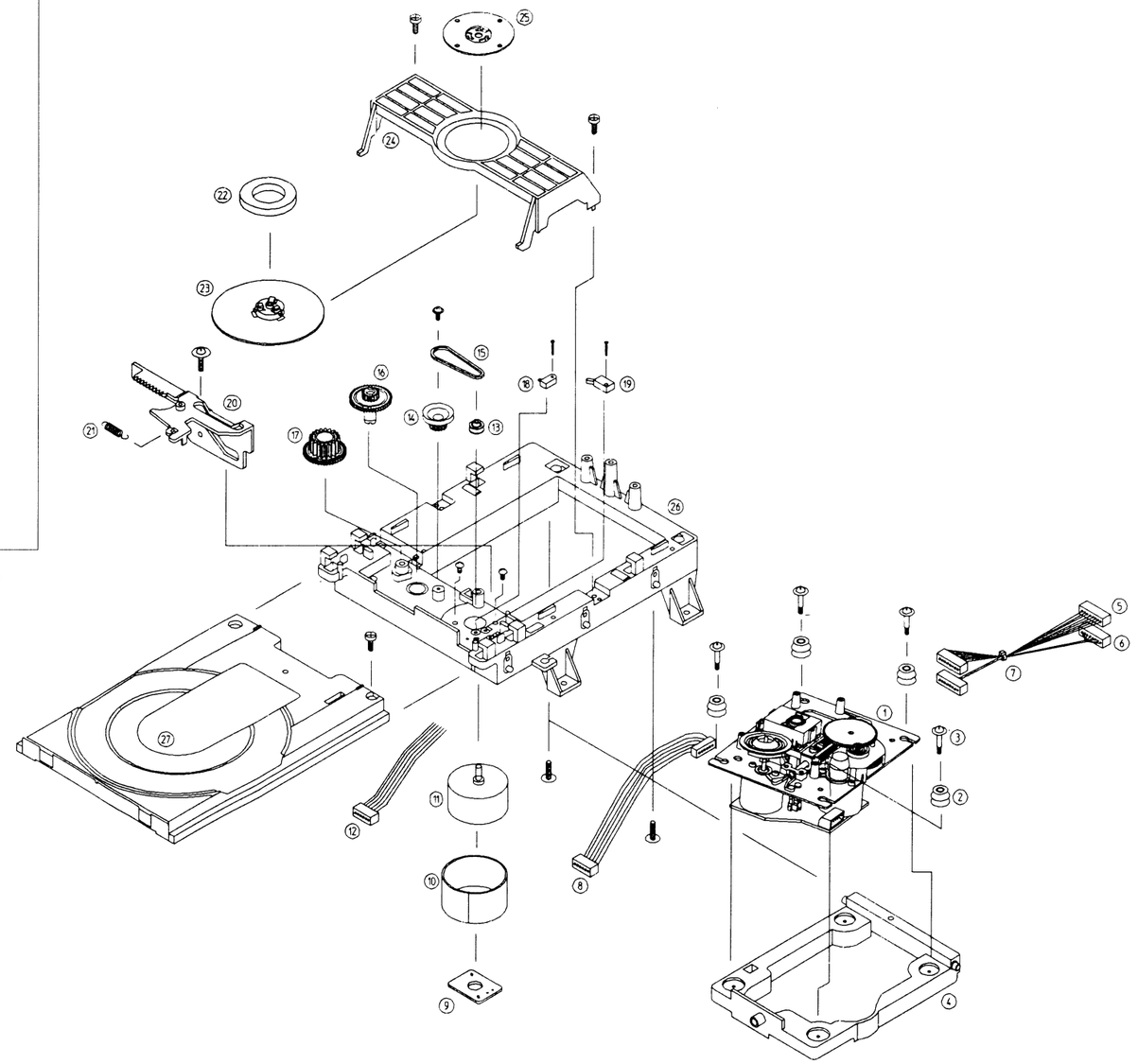
No.	Code no.	Description	Specification	Q'TY	REMARK
1	14073-0194-00	WINDOW-DOOR(A)	MQ-485Z T3.0 VIOLET PMMA	1	
2	14073-0195-01	WINODW-DOOR(B)	MQ-485Z T3.0 VIOLET PMMA	1	
3	14042-0097-02	DOOR-CASS(A)	MAX485/EXP T3.0 BLK ABS	1	
4	14042-0098-02	DOOR-CASS(B)	MAX485/EXP T3.0 BLK ABS	1	
5	13322-0128-00	HOLDER-CASS(B)	MQ-485Z T3.0 BLK ABS	1	
6	13322-0127-00	HOLDER-CASS(A)	MQ-485Z T3.0 BLK ABS	1	
7	12724-0145-00	SPRING-EJECT(R)	TS SUS PT0.8 MQ-485	1	
8	12724-0144-00	SPRING-EJECT(L)	TS SUS PT0.8 MQ-485	1	
9	14073-0193-00	WINDOW-CD	MQ-485Z T3.0 VIOLET PMMA	1	
10	13054-0034-00	CUSHION-FOOT	MQ570A T2.0 HH-38C	4	
11	A0120-0200	BADGE-BRAND	L27 20 D2XD1.5 L5XL0.9	1	
12	12000-0189-02	CABINET-FRONT	MQ-485Z ABS T2.5 BLK	1	
13	13014-0204-00	BRACKET-CD	MQ-485Z T1.2 SECC	2	
14	19113-0133-00	ASS'Y-LATCH(L)	MQ-485Z MOLD POM	1	
15	15214-506-011	DAMPER-ASS'Y	POM PD790	2	
16	14083-0464-01	KNOB-SKIP	MQ485Z BLK ABS	1	
17	14083-0465-01	KNOB-CD PLAY	MQ485Z BLK ABS	1	
18	13073-0005-00	SUPPORTER-DECK	MAX485Z BLK ABS 94HB	1	
19	19113-0134-00	ASS'Y-LATCH(R)	MQ-485Z MOLD POM	1	
20	14083-0466-02	KNOB-DECK	MAX485Z/EXP BLK ABS	1	
21	13322-0017-00	HOLDER-FL	ABS T2.0 BLK MQ460R	1	
22	12001-0193-00	CABINET-BOTTOM	MQ-485Z T0.8 SECC	1	
23	13004-0007-00	FOOT	MQ710A BLK ABS	2	
24	17159-0051-00	DECK-CASSETTE	CWA418 FR RED 1630	1	
25	12002-0186-04	CABINET-TOP	MQ-485Z V/STEEL T0.75 B	1	
26	14043-0096-02	DOOR-CD	MAX485Z/EXP T1.8 BLK ABS	1	
27	*CMSA3M6C	DECK-CD MINT MECHA ASS'Y	CMS-A3M6C S	1	
28	12213-0010-00	FRAME-CD	MQ-485Z T1.2 SECC	2	
29	15684-507-530	HEAT-SINK	AL EXTR BLK 40H, SCM6550	2	
30	12002-0191-02	CABINET-REAR	MAX485Z/EXP T0.8 SECC	1	

10-3. CD deck ASS'Y parts list

No.	Code no.	Description	Specification	Q'TY	REMARK
	*CMS-A3M6U	CMS-A3M6U	CD-MECHA	1	
1	*CMS-A30NM6	CMS-A30NM6	CD DECK	1	
2	16174-503-411	RUBBER-CD	SI RUBBER	4	
3	15104-531-710	SHAFT-CD	FE FZY 2.6 X 10.5	4	
4	11532-0004-00	LEVER-LIFTER DECK	ABS BLK	1	
5	13076048-020	CONNECTOR-WIRE/BN	51004-08P/51004-08P	1	
6	16634-502-610	CONNECTOR-WIRE/BN	8P SHIELD	1	
7	16634-502-610	CABLE-TIE	NYLON 66	2	
8	13070-046-125	CONNECTOR-WIRE/BN	51004-06P/51004-06P	1	
9	16024-0083-00	PCB-MOTOR	FR-1 T1.6	1	
10	13014-0062-00	BRKT-SHIELD	GII T0.35	1	
11	B3070-0002	MOTER-DC	RF-500TB 9V	1	
12	13029-064-120	CONNECTOR-WIRE	51004-06P	1	
13	11504-0002-00	PULLEY-MOTOR	P.O.M BLK	1	
14	11504-0001-00	PULLEY-GEAR	P.O.M BLK	1	
15	11494-0001-00	BELT-PULLEY	NEOPLENE	1	
16	11474-0006-00	GEAR(A)	NYLON 12	1	
17	11474-0007-00	GEAR(B)	P.O.M BLK	1	
18	13573-901-050	SWITCH-MICRO	SPPN-11	1	
19	B3022-0004	SW-LEAF	MLS-1	1	
20	11583-0001-00	CAM	PC BLK	1	
21	12724-0010-00	SPRING-CAM	ES STS-W	1	
22	14014-500-00	MAGNET-CHUCK	SR FERRITE	1	
23	12223-0015-00	TABLE-CHUCK	P.O.M BLK	1	
24	13329-0013-00	HOLDER-CHUCK	ABS BLK	1	
25	13014-0119-00	BRKT-CHUCK	SECC 0.8T	1	
26	12201-0013-00	BASE-MAIN	ABS BLK	1	
27	13602-0001-01	TRAY	ABS BLK	1	

- Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

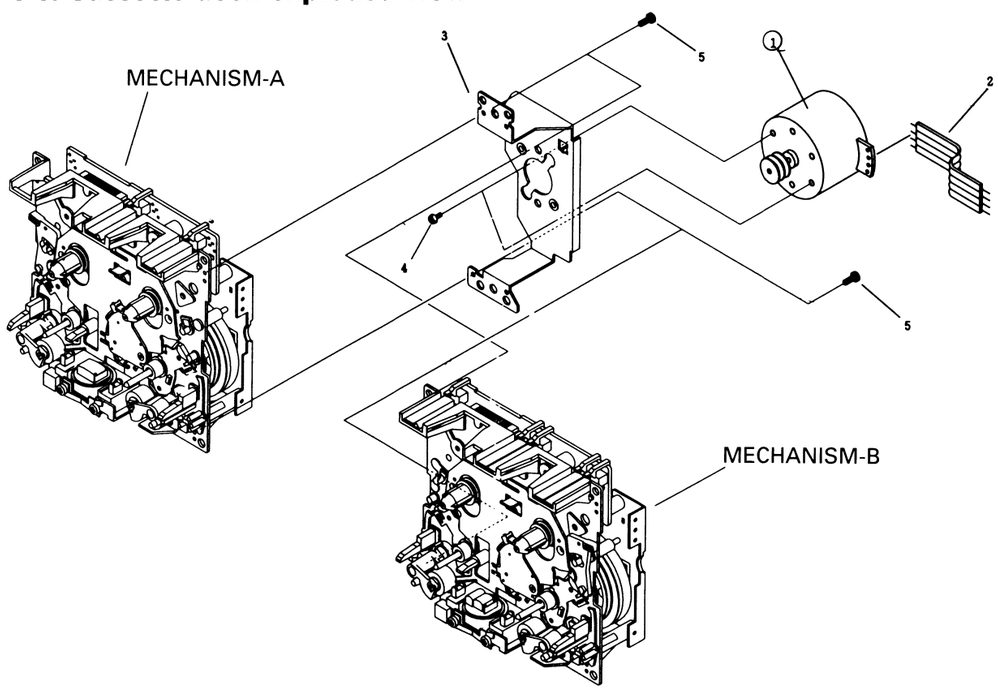
10-3-1. CDP exploded view (CMS-A30NM6)



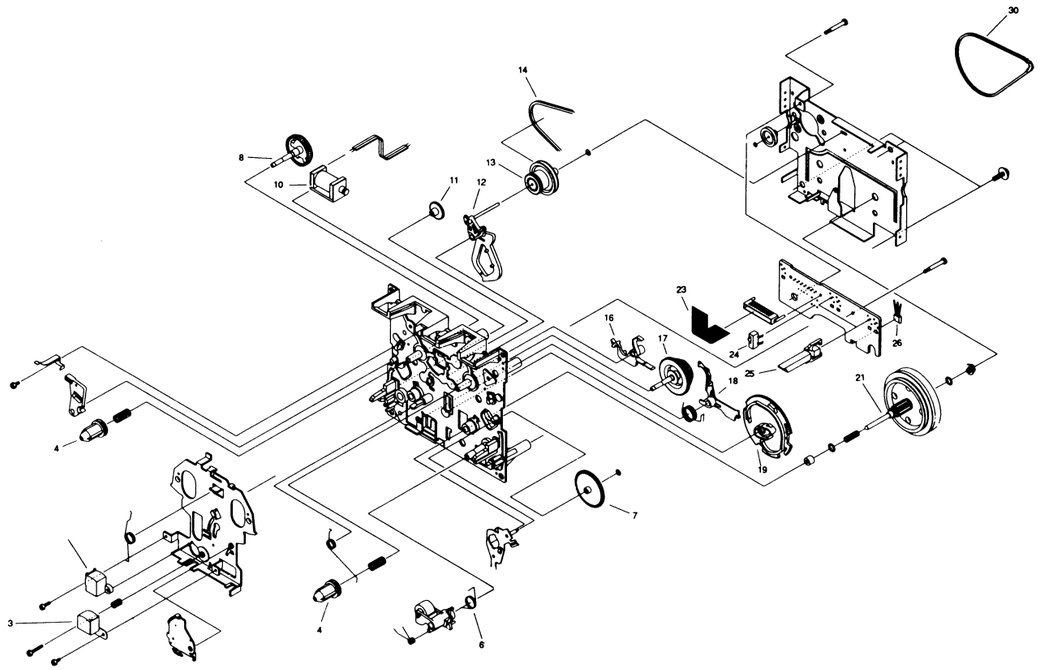
10-4. Cassette deck parts list

No.	Code no.	Description	Specification	Q'TY	REMARK
	17159-0051-00	DECK ASS'Y	CWA418FR		
1	10000-503-002	MOTOR	SHU2L	1	
2	10000-524-023	ASS'Y HOLDER HEAD	YK56RAB4N3	1	B DECK
3	10000-523-008	R/P HEAD	MS 15RAA2N1	1	A DECK
4	10000-611-009	CAP REEL	22-222-4041	4	
5	10000-611-010	ASS'Y PINCH ARM L	22-093-4149	1	B DECK
6	10000-611-012	ASS'Y PINCH ARM R	22-093-4150	2	
7	10000-611-057	GEAR PLAY	22-222-4282	3	
8	10000-611-015	REEL GEAR	22-222-3030	1	A DECK
9	10000-611-017	ASS'Y SUB REEL L	22-093-3071	1	B DECK
10	10000-611-018	SOLENOID	07-W021C	2	
11	10000-611-021	GEAR FF	22-222-4048	2	
12	10000-611-022	ASS'Y ARM FR	22-093-4061	2	
13	10000-611-023	ASS'Y PULLEY FR	22-093-3060	2	
14	10000-611-024	BELT FR	22-083-4059	2	
15	10000-611-026	ASS'Y FLYWHEEL L2	22-093-3142	1	B DECK
16	10000-611-028	ARM BRAKE	22-239-3028	2	
17	10000-611-029	ASS'Y SUB REEL R	22-093-4151	2	
18	10000-611-030	ARM TRIGER	22-268-3008	2	
19	10000-611-031	GEAR CAM	22-221-2090	2	
20	10000-611-033	ASS'Y FLYWHEEL R2	22-093-3141	1	B DECK
21	10000-611-027	ASS'Y FLYWHEEL R	22-093-3050	1	A DECK
22	10000-611-061	WIRE	300MM 13P	1	B DECK
23	10000-611-062	WIRE	300MM 11P	1	A DECK
24	10000-611-038	SWITCH MODE	04-MPU10101MBO	2	
25	10000-611-039	SWITCH LEAF	04-MT510041MVJ1	6	
25	10000-611-040	HALL IC	00-LB9051A	2	
27	10000-611-046	P.C BOARD	22-070-4046	1	B DECK
28	10000-611-047	HOUSING	00-S5BEH	1	B DECK
29	10000-611-054	BELT MAIN	02-083-4076	1	B DECK
30	10000-611-055	BELT MAIN	02-083-4075	1	A DECK

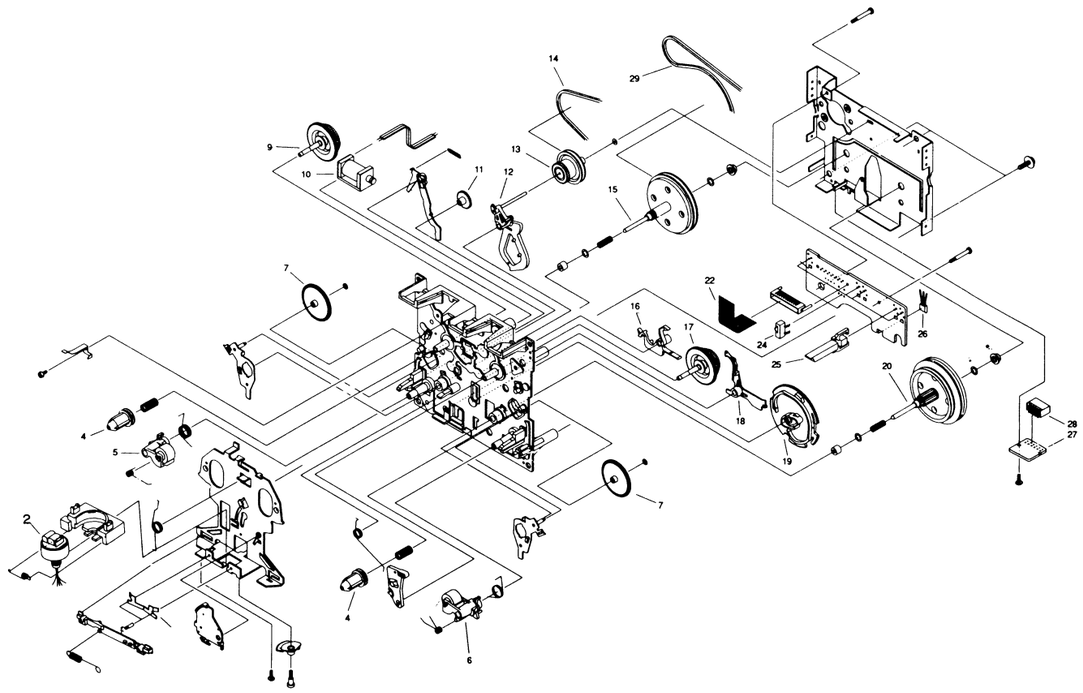
10-4-1. Cassette deck exploded view



10-4-2. A deck (P/B deck)

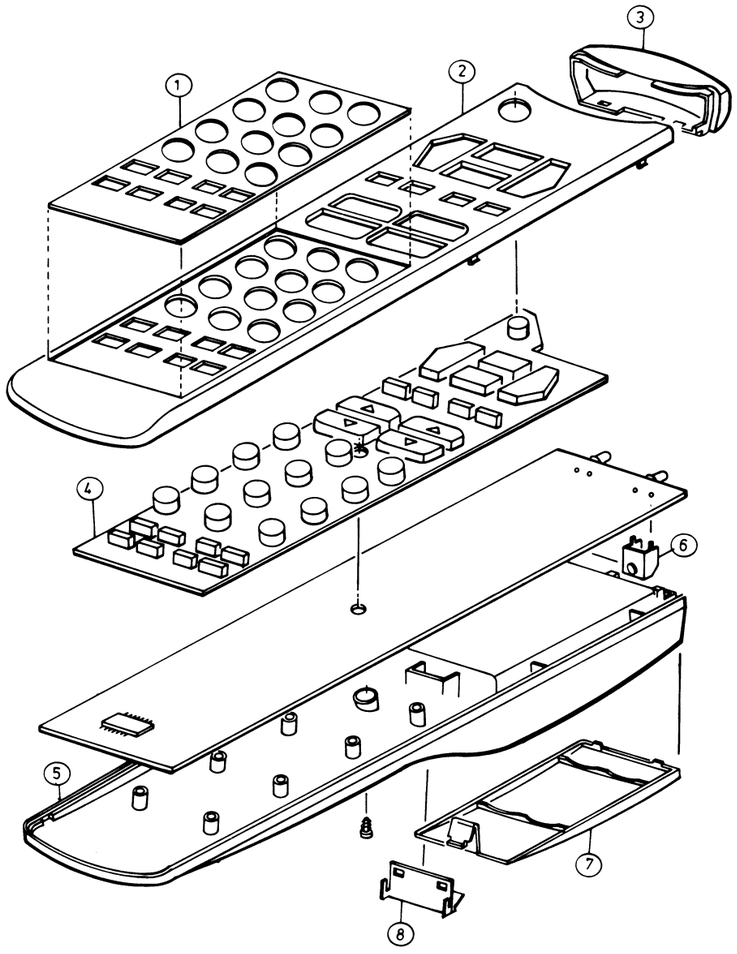


10-4-3. B deck (R/P deck)



10-5. Remote control

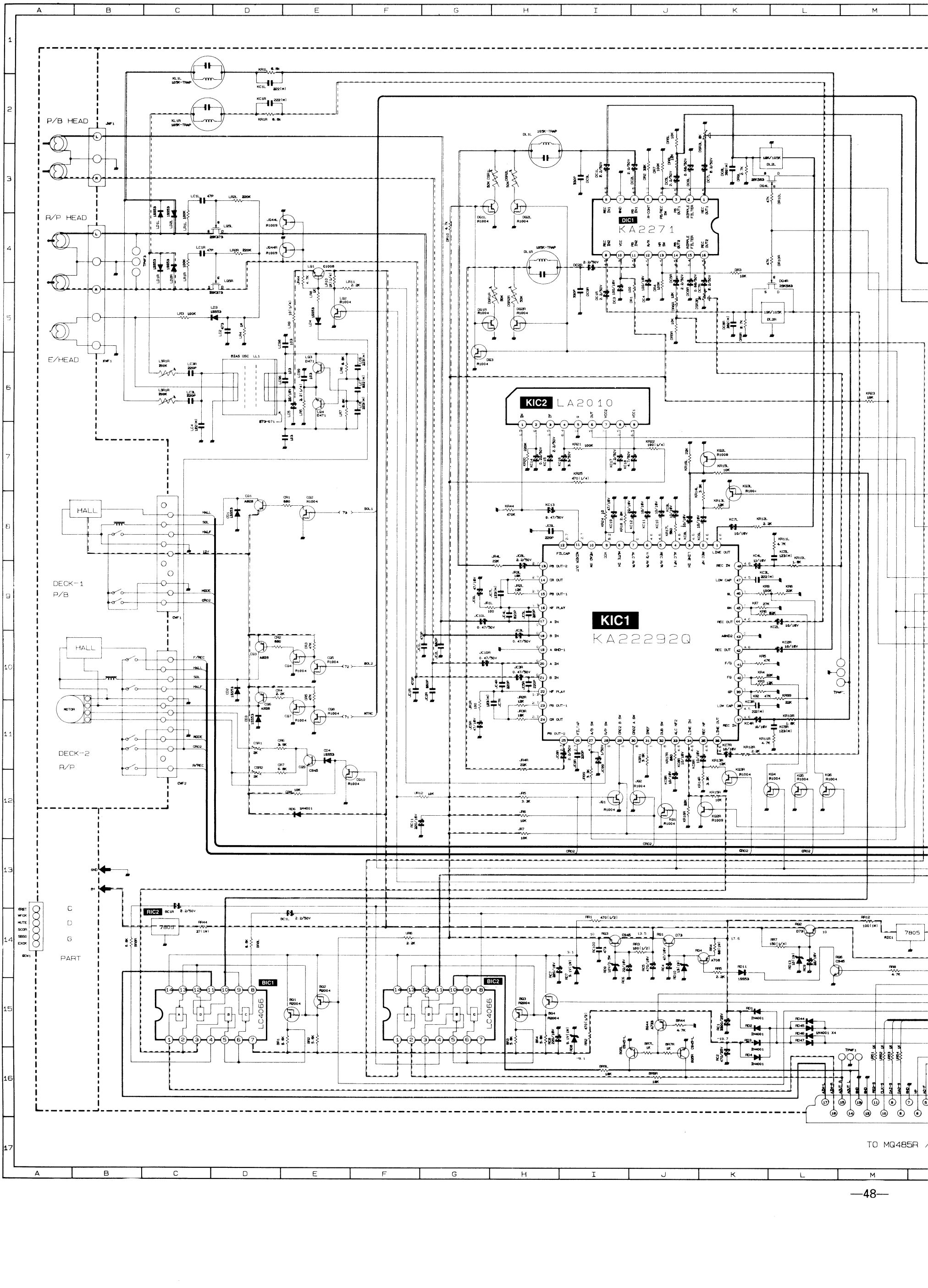
10-5-1. Exploded view

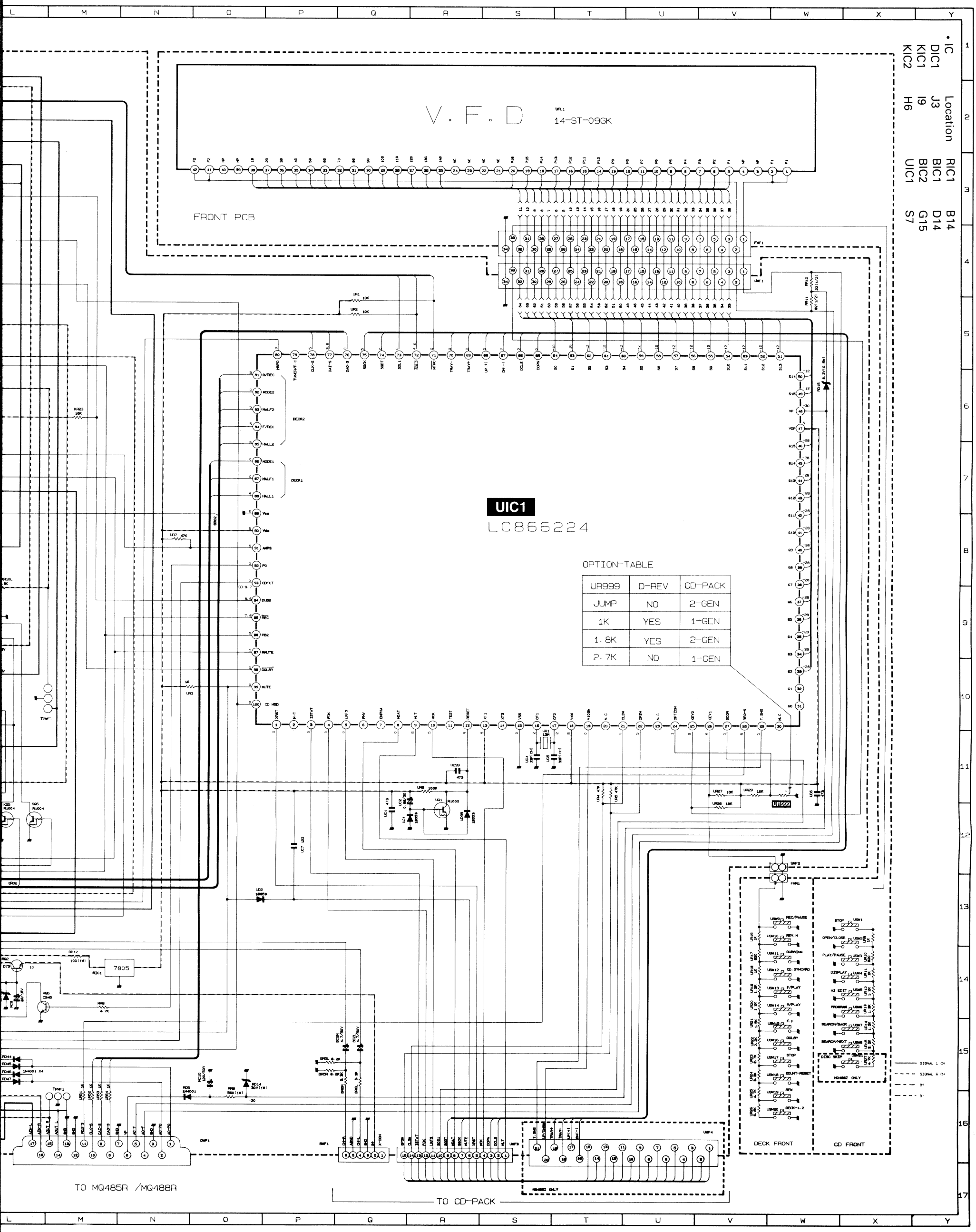


10-5-2. Parts list

No.	Code no.	Decription	Specification	Q'TY	REMARK
	19239-0020-01	ASS'Y REMOCON	MAX-485R EXP	1	
1	14014-0026-02	INLAY-REMOCON	MAX-485R T0.5 PC	1	
2	12002-0237-00	CABINET-TOP	MQ485R T2 BLK ABS	1	
3	12713-0008-00	LENS-REMOCON	PC MQ360R T2.5	1	
4	14083-0621-02	KNOB-REMOCON	MAX-485R SILICON	1	
5	12001-0055-00	CABINET-BOTTOM	ABS 94HB T2 BLK	1	
6	12724-0046-00	SPRING-BATTERY	PS SUS T0.15 W22.3 L12	2	
7	13313-0026-00	COVER-BATTERY	ABS 94HB T1.5 BL	1	
8	12724-0047-00	SPRING-BATTERY	PS SUS T0.3 W15.5 L9	1	
	11449-518-101	CONDENSER AXIAL-LEAD	50V UP050 B100-K	2	
	12149-401-150	TRANSISTOR	KSD 471-Y, TAPE	1	
	14539-504-030	CERAMIC-RESONATOR	CSB455EBL	1	
	B4012-0014	IC-LINEAR	LC7464M-8117 SOP REMOCON	1	

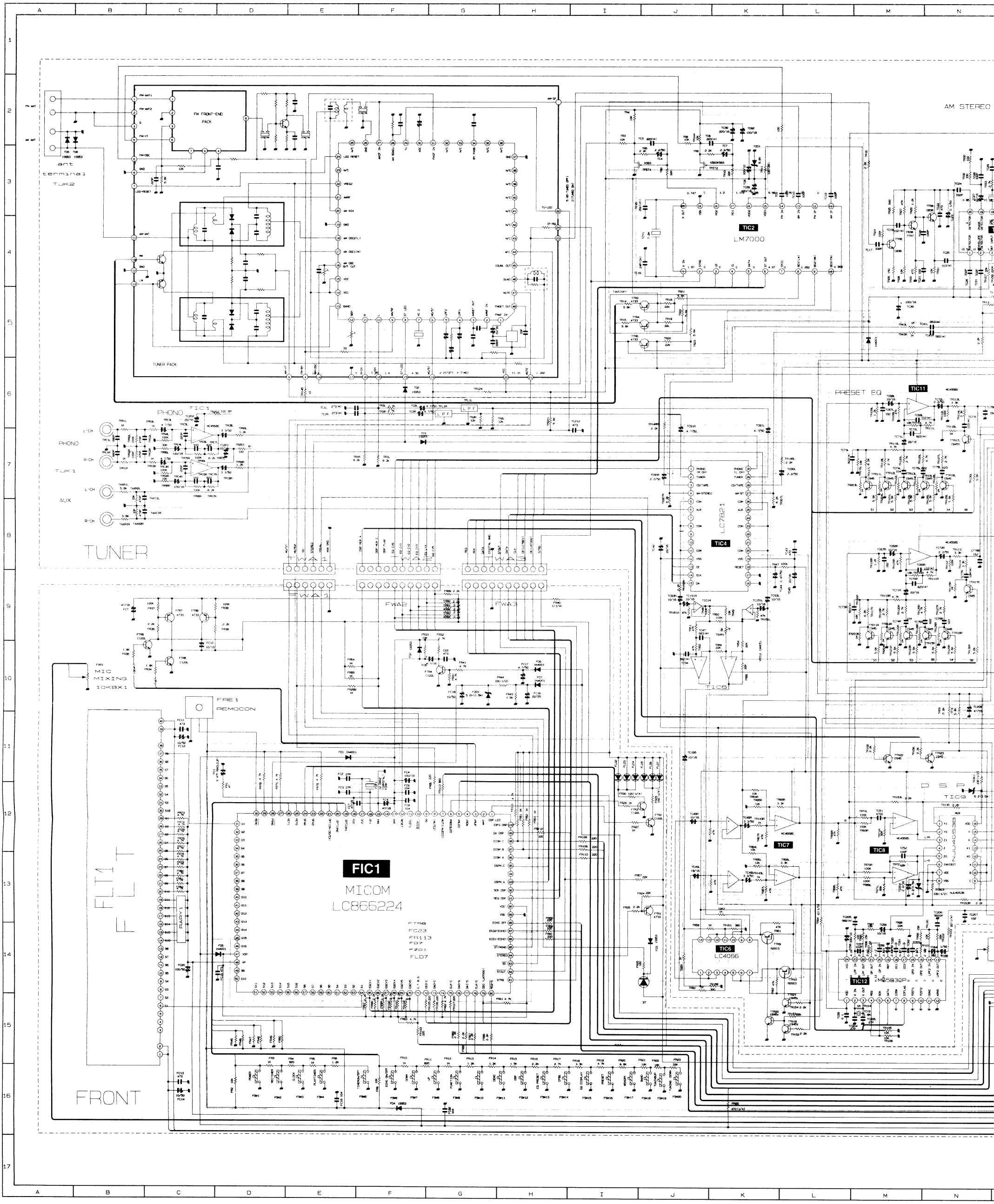
11-2. Cassette deck section




• IC Location
DIC1 J3
KIC1 I9
KIC2 H6
RIC1 B14
BIC1 D14
BIC2 G15
UIC1 S7
V.F.D
14-ST-09GK
FRONT PCB
UIC1
LC866224
OPTION-TABLE
UR999 D-REV CD-PACK
JUMP NO 2-GEN
1K YES 1-GEN
1.8K YES 2-GEN
2.7K NO 1-GEN
UR999
7805
DECK FRONT
CD FRONT
SIGNAL L CH
SIGNAL R CH
B+
B-
TO MQ485R /MQ488R
TO CD-PACK

11. Schematic diagram

11-1 Amp & Tuner section

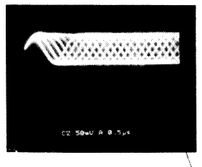


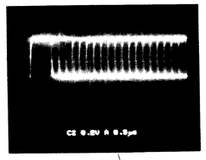
1. The unit of all resistors is Ω unless otherwise stated. (K : KΩ, M : KΩ). All resistors are 1/4W or 1/8W unless otherwise stated.
2. The unit of all capacitors is μF unless otherwise stated. (P : PF).
3. The schematic diagram is subject to change upon improvement without prior notice.
4. ⚠ indicates parts for circuit safe guarding purposes. Therefore, when replacing be sure to use specified parts only.

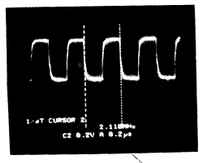
- IC Location

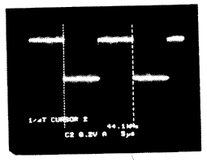
IC	Location
TIC1	C6
TIC2	K4
TIC3	O4
TIC4	K8
IC5	K9
TIC6	K13
TIC7	L12
TIC8	N12
TIC9	N12
TIC10	P12
TIC11	N7
TIC12	M4
MIC1	P6
MIC2	P7
MIC5	U3
MIC6	U3
MIC7	U3
MIC8	U3
MIC9	R3
MIC10	T4
MIC11	S3
MIC12	U6
MIC13	U7
MIC14	R13
MIC15	R15
MIC16	R15
MIC17	R11
MIC18	R14

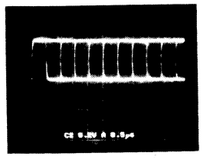
11-3. CD section



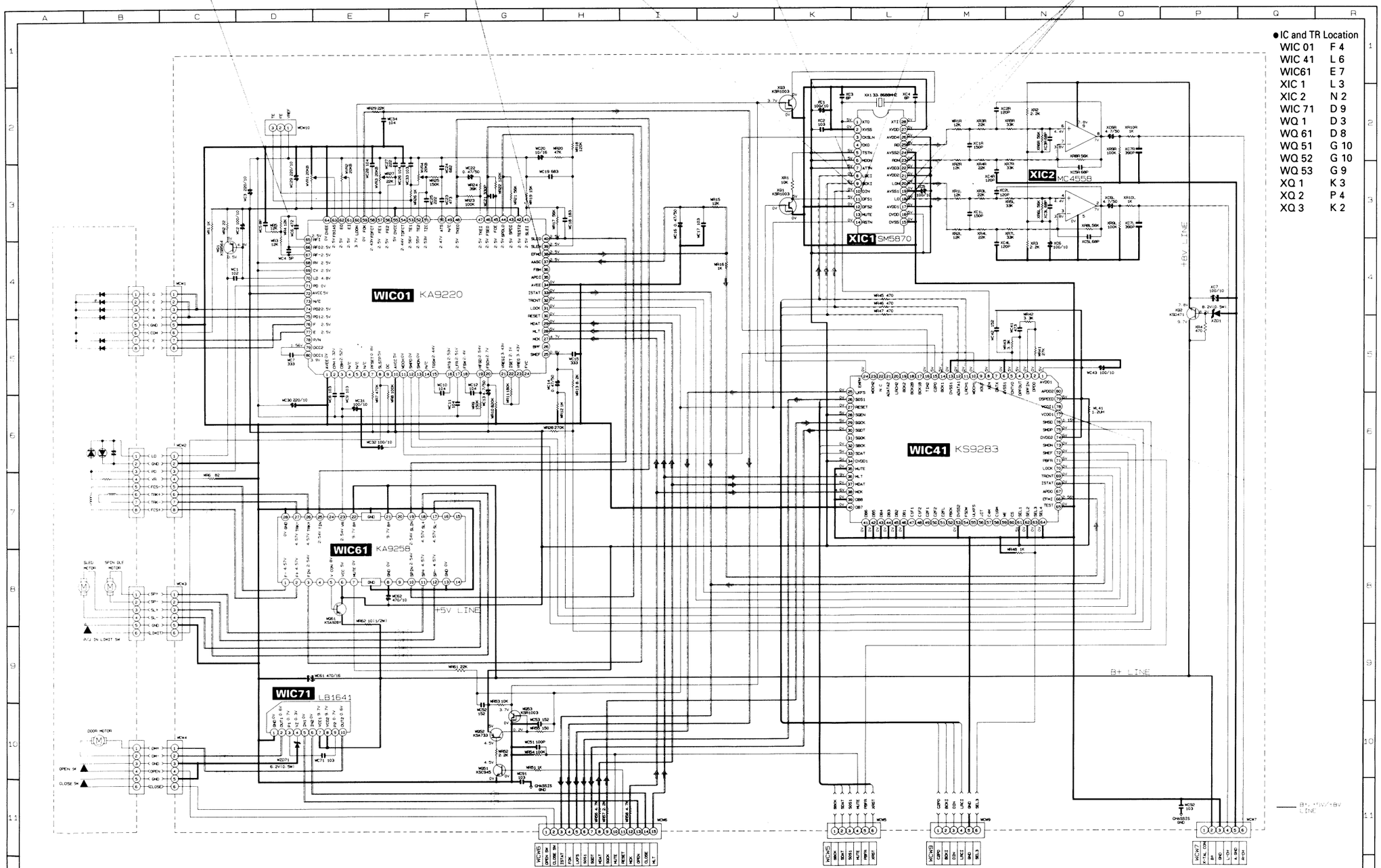






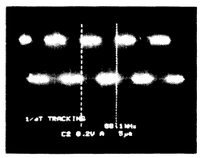


• WAVE FORM=10 : 1



● IC and TR Location

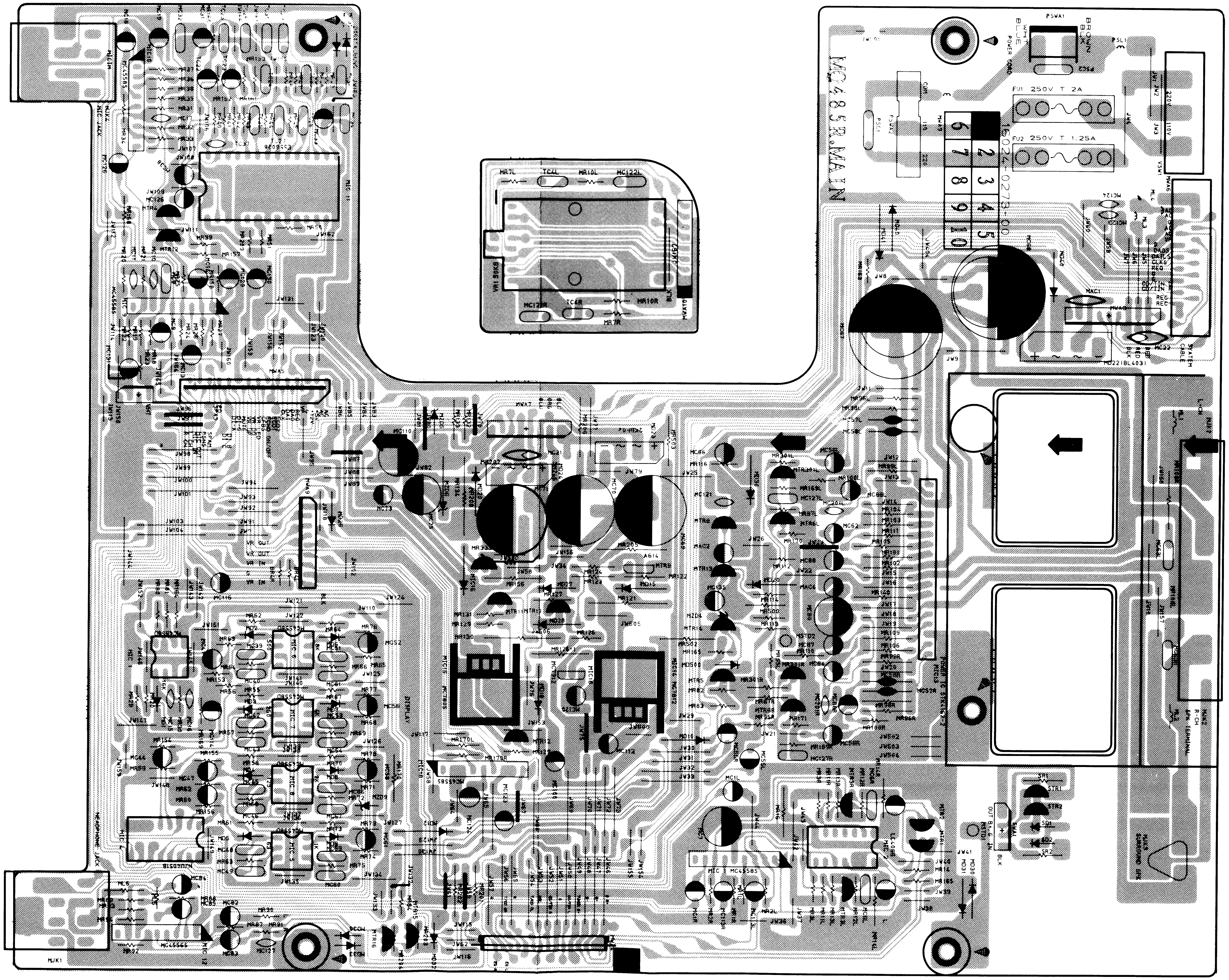
WIC 01	F 4
WIC 41	L 6
WIC61	E 7
XIC 1	L 3
XIC 2	N 2
WIC 71	D 9
WQ 1	D 3
WQ 61	D 8
WQ 51	G 10
WQ 52	G 10
WQ 53	G 9
XQ 1	K 3
XQ 2	P 4
XQ 3	K 2



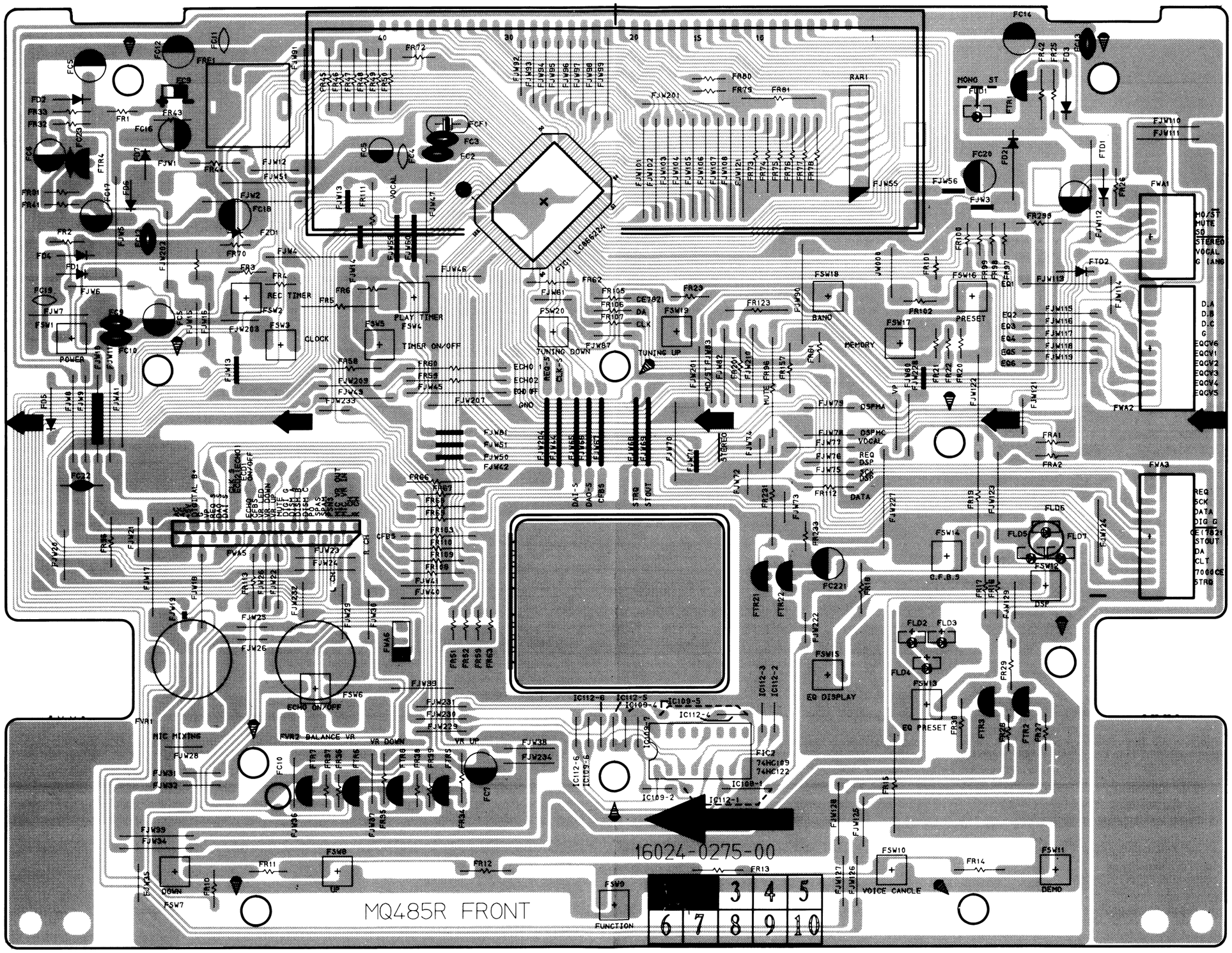
12. PCB Pattern and Marking diagram

12-1. Amp & Power section (MAX-485R)

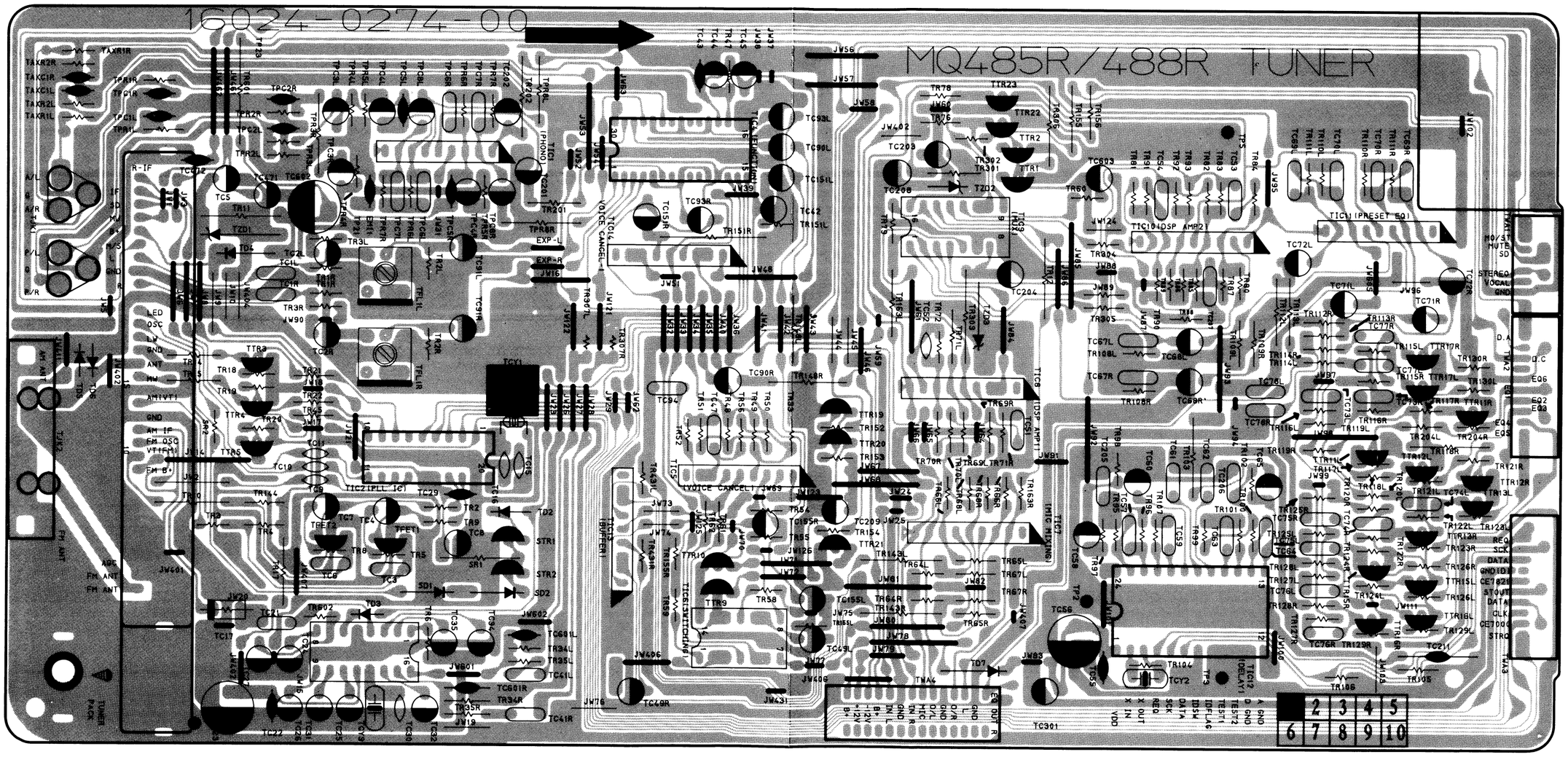
12-1-1. Main/Volume section



12-1-2. Front PCB

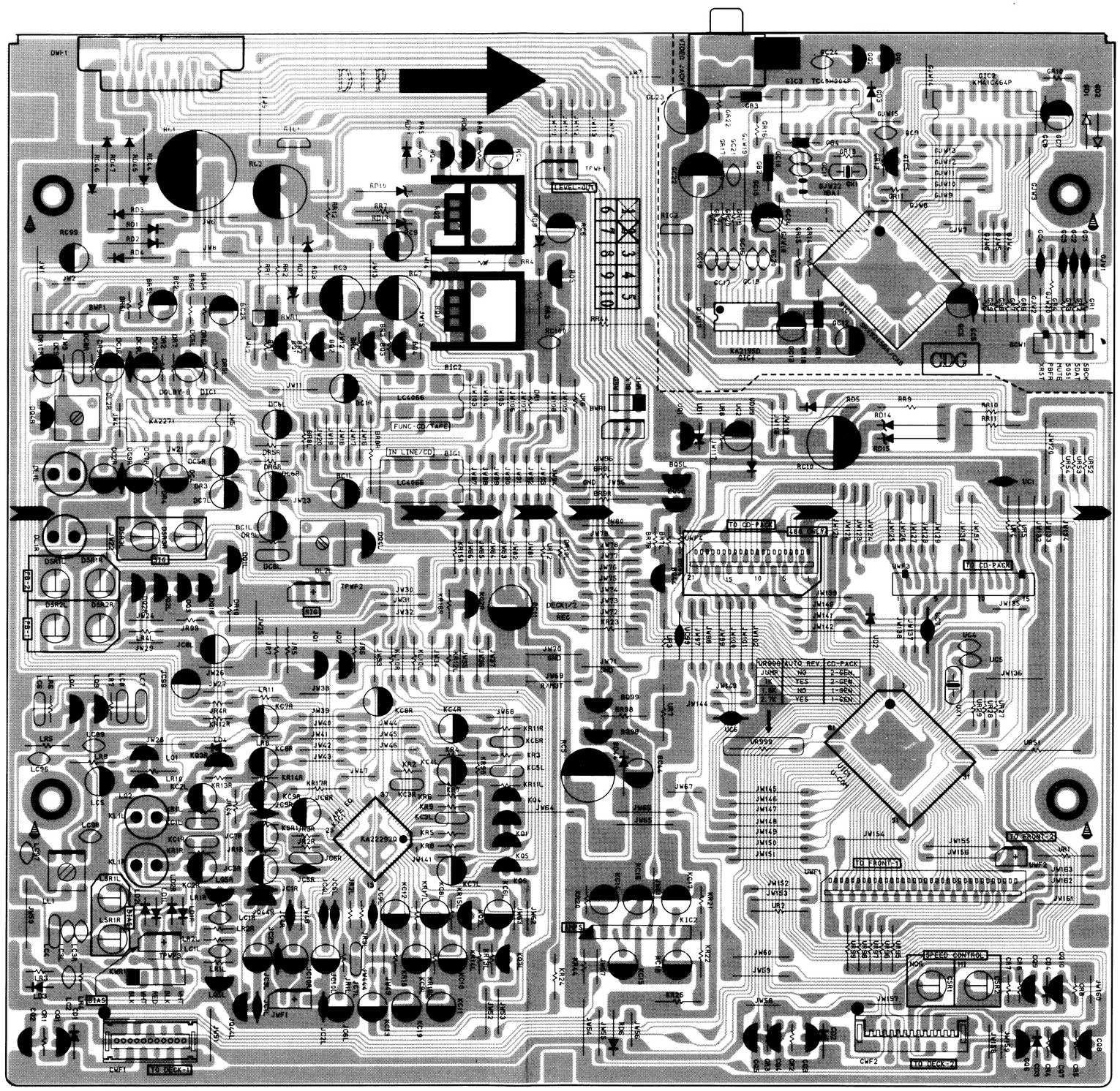


12-1-3. Tuner Section

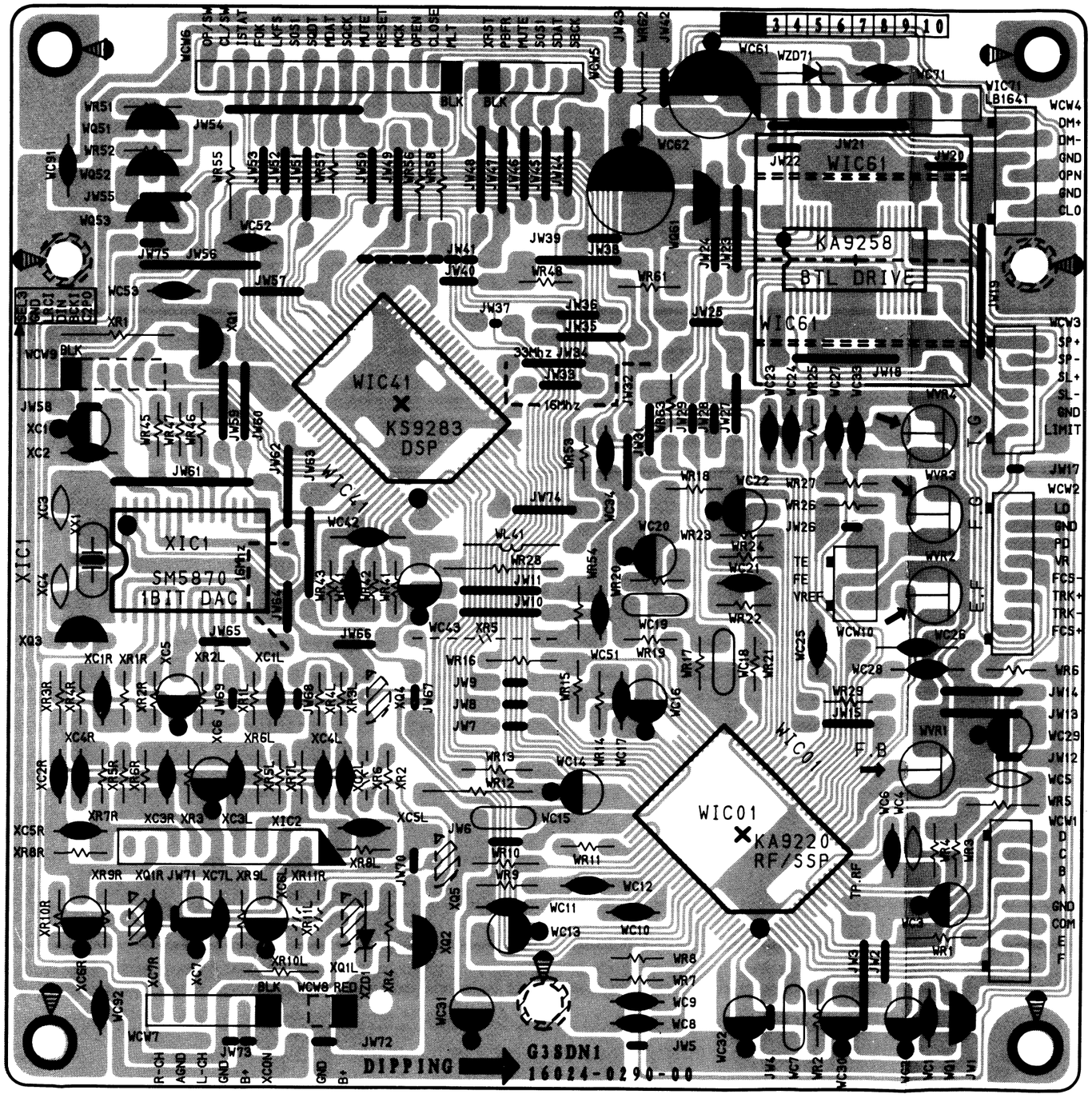


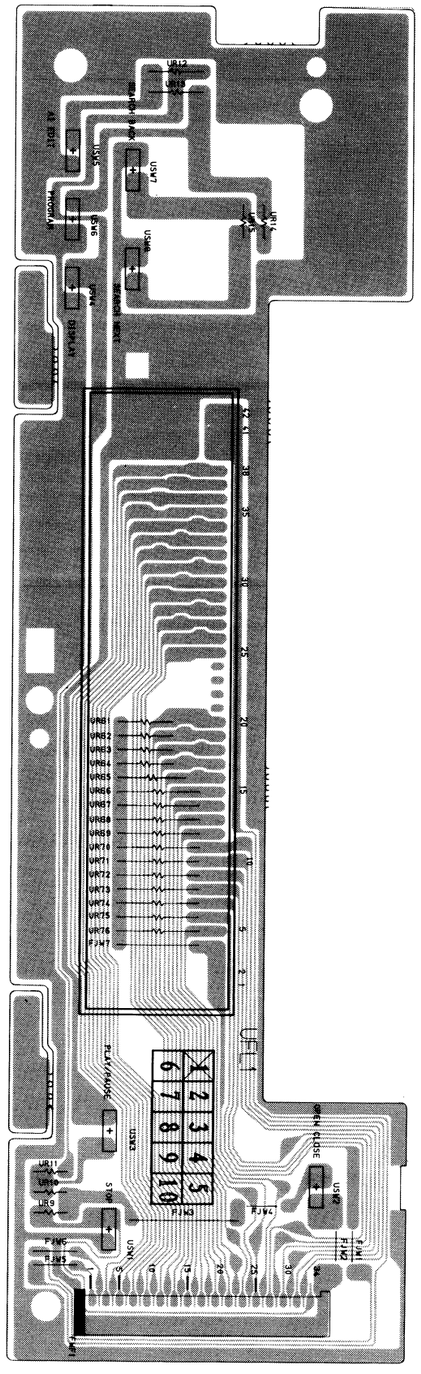
12-2. CD & Deck section (MAX-485Z)

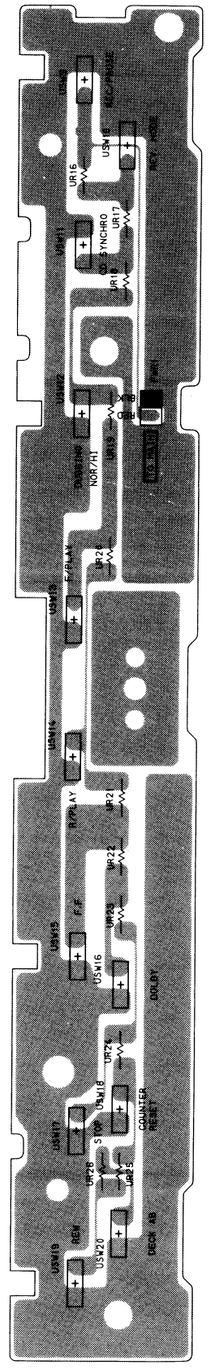
12-2-1. Main section



12-2-2. CD & Deck section

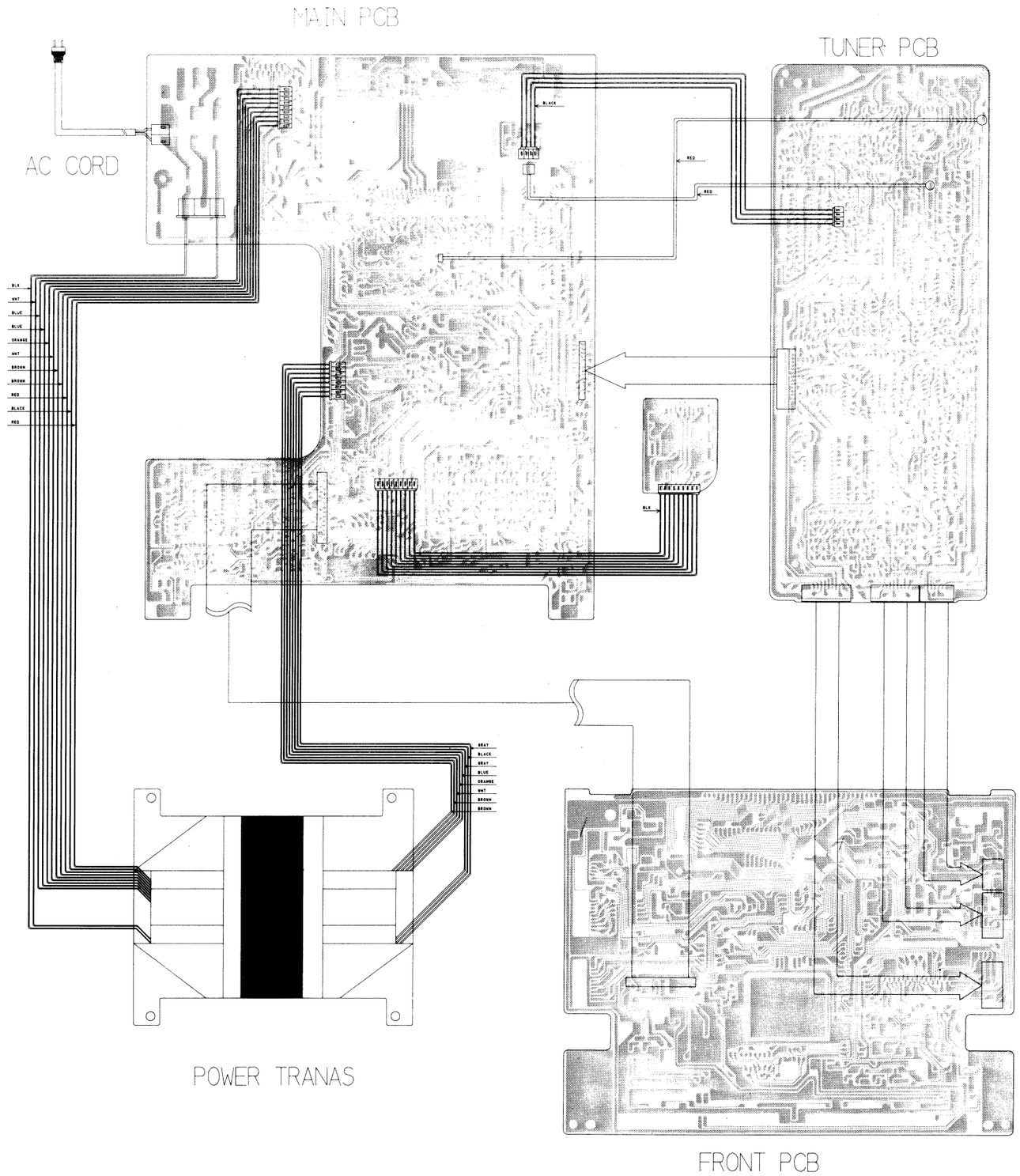




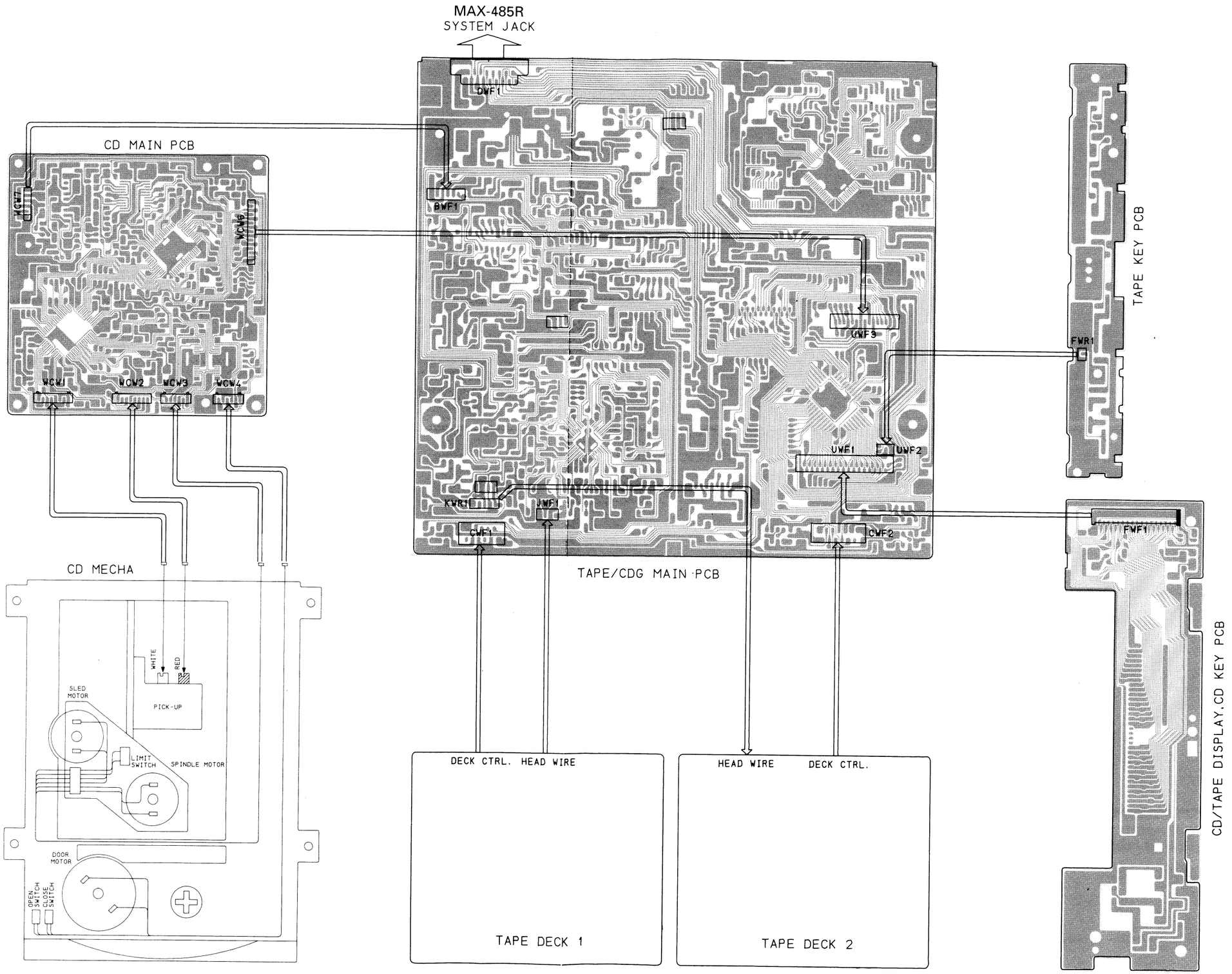


13. Wiring diagram

13-1. Amp & Tuner section



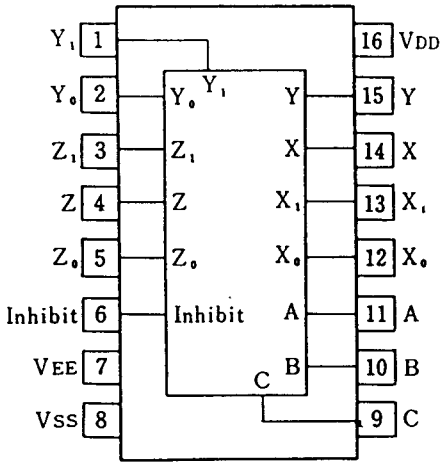
13-2. CD & Deck section

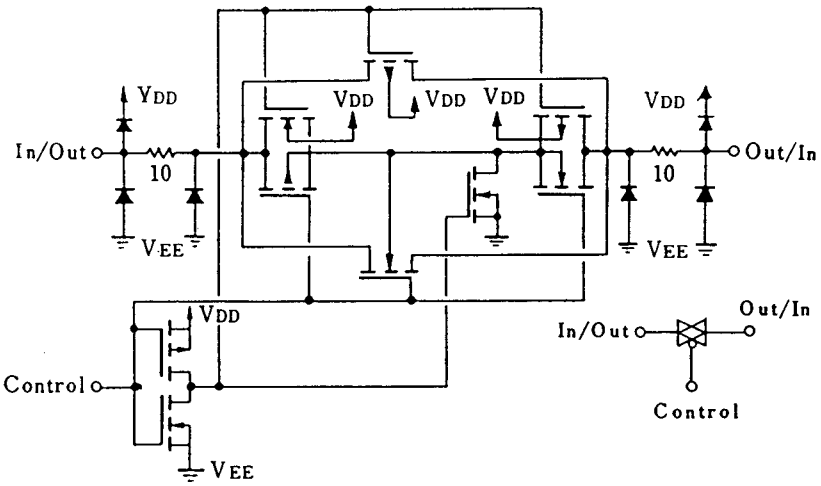


14. IC & TR internal diagram

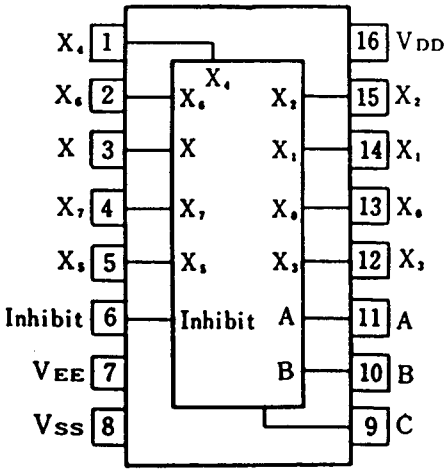
14-1. Amp & Tuner section

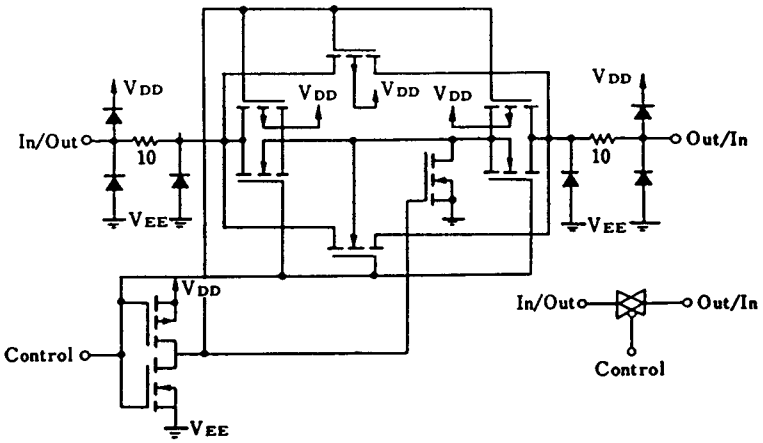
• NJU4053BD



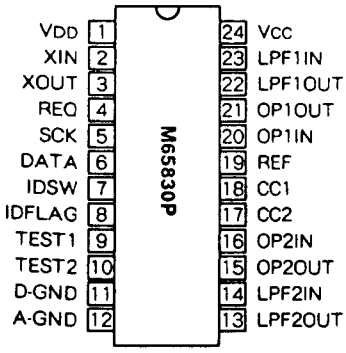


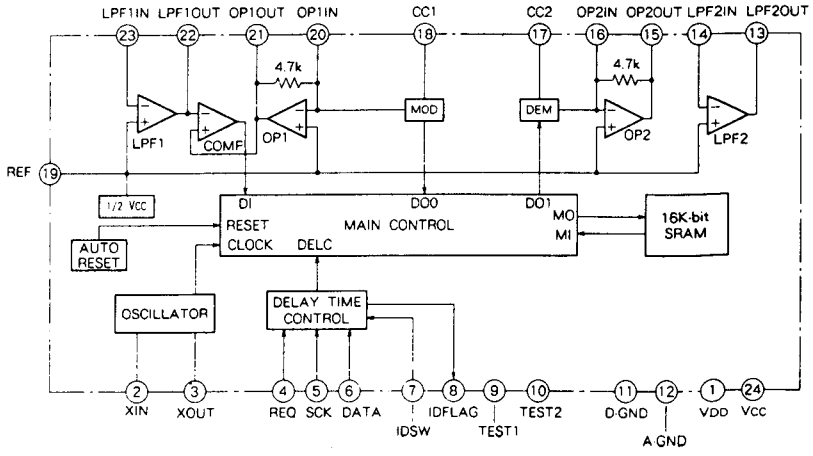
• NJA4051BD



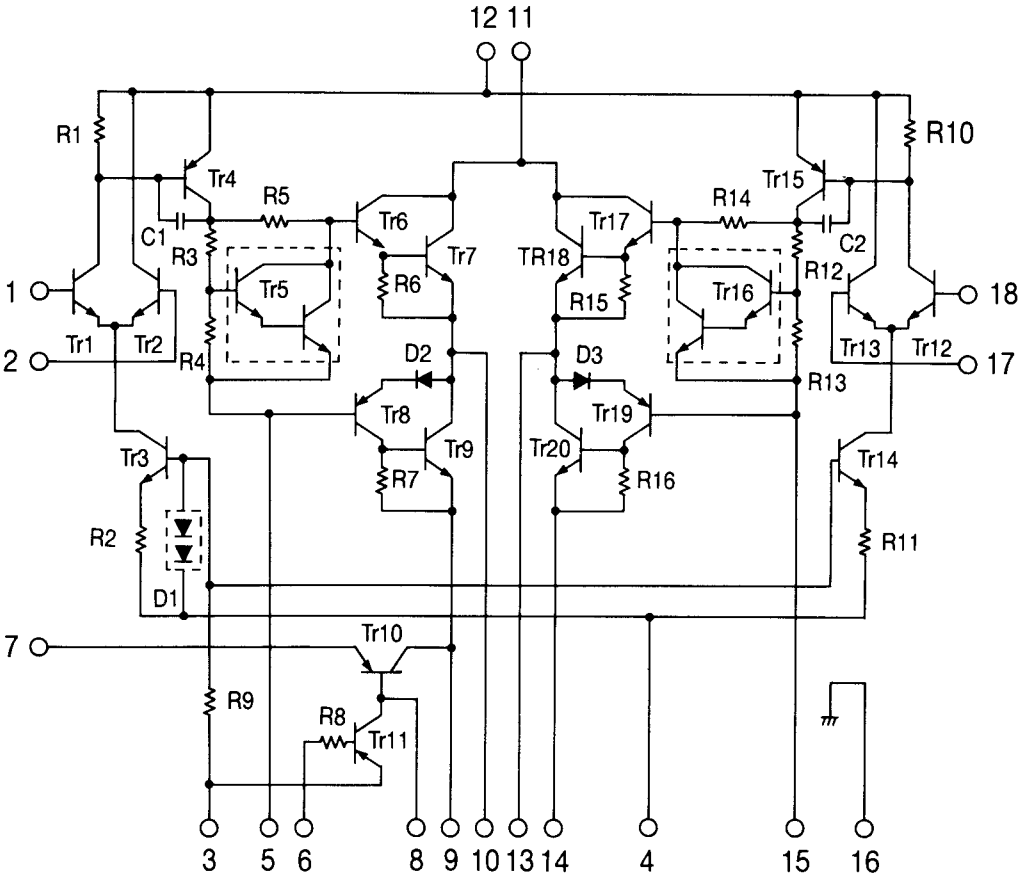


• M65830P



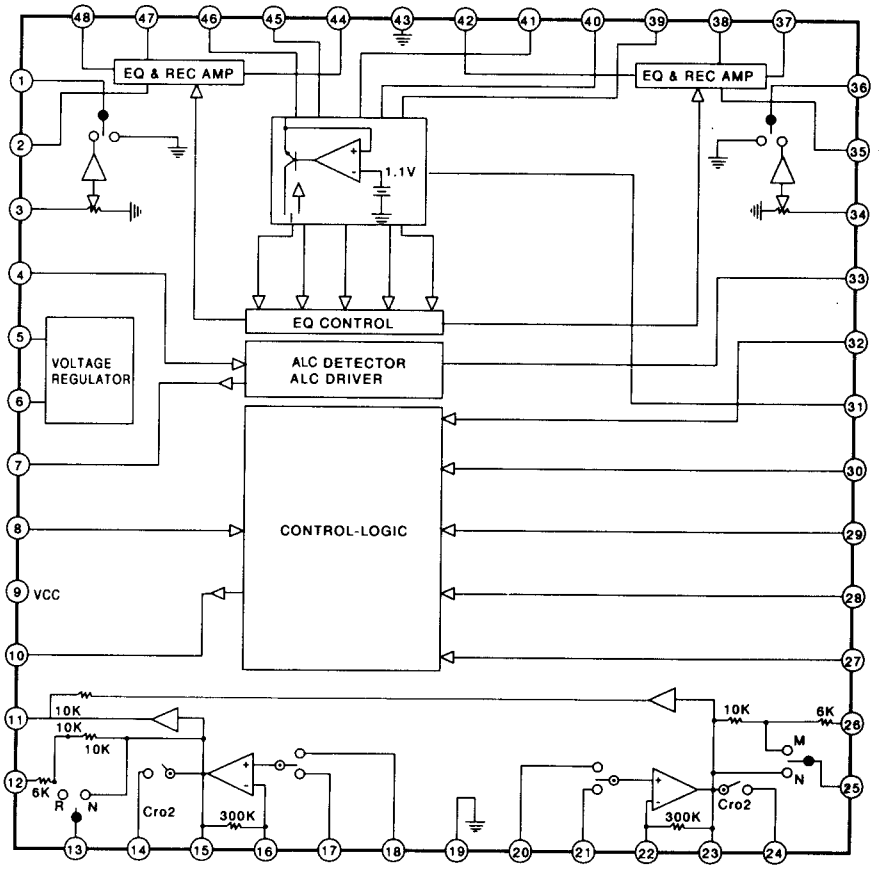


• STK4141V



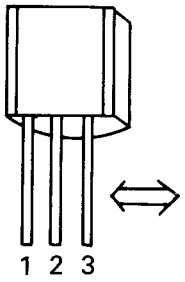
14-2. Cassette deck section

• KA22292Q



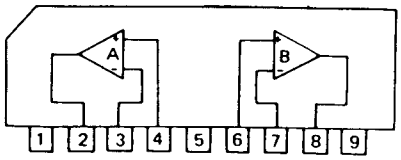
14-3. CD section

• TR



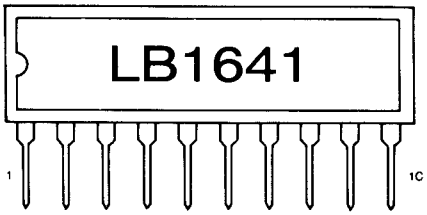
TR	1	2	3
KSR1003, KSR1009	E	C	B
KSC945, KSA733 KSB564	E	B	C

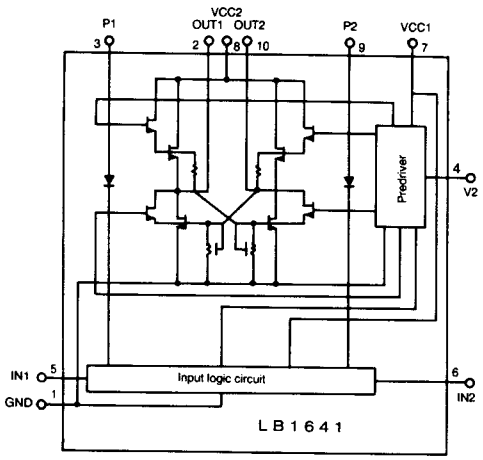
• MC4558S (OP AMP) : XIC2



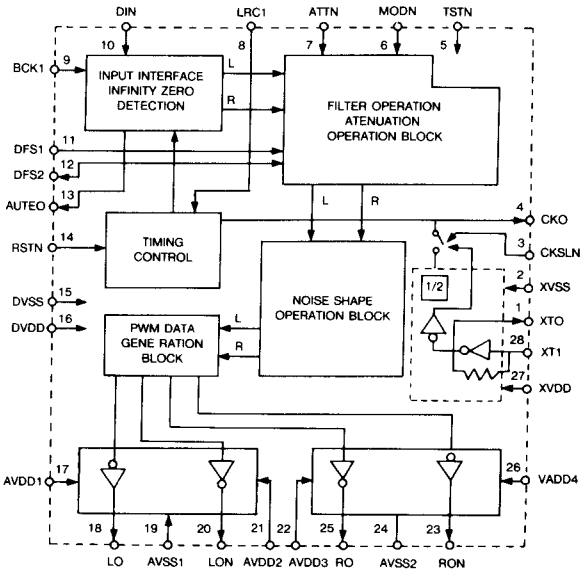
1.V+
2.A OUTPUT
3.A-INPUT
4.A+INPUT
5.V-
6.B+INPUT
7.B-INPUT
8.B OUTPUT
9.V+

• LB 1641 (MOTOR DRIVER) : WIC71

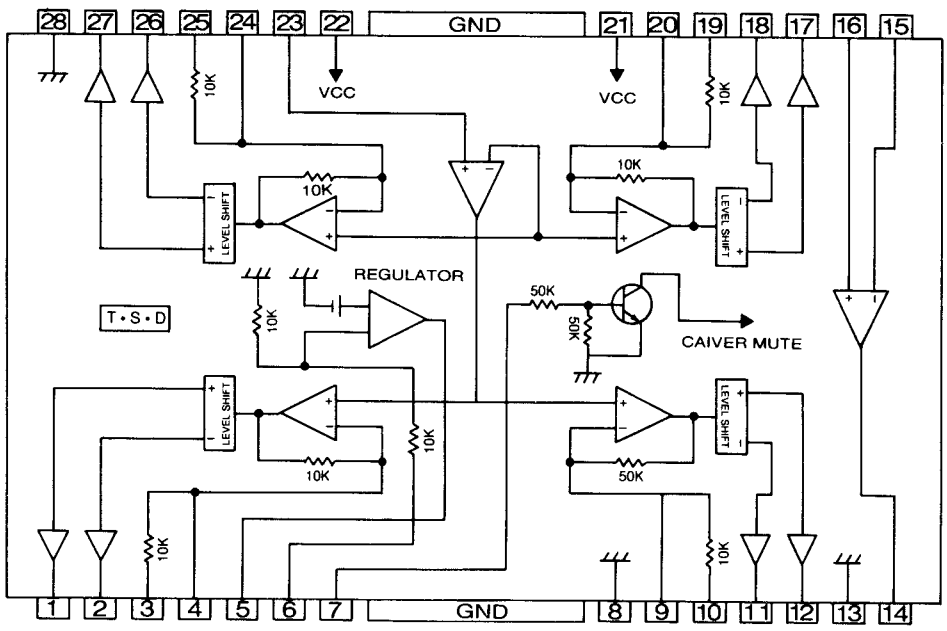




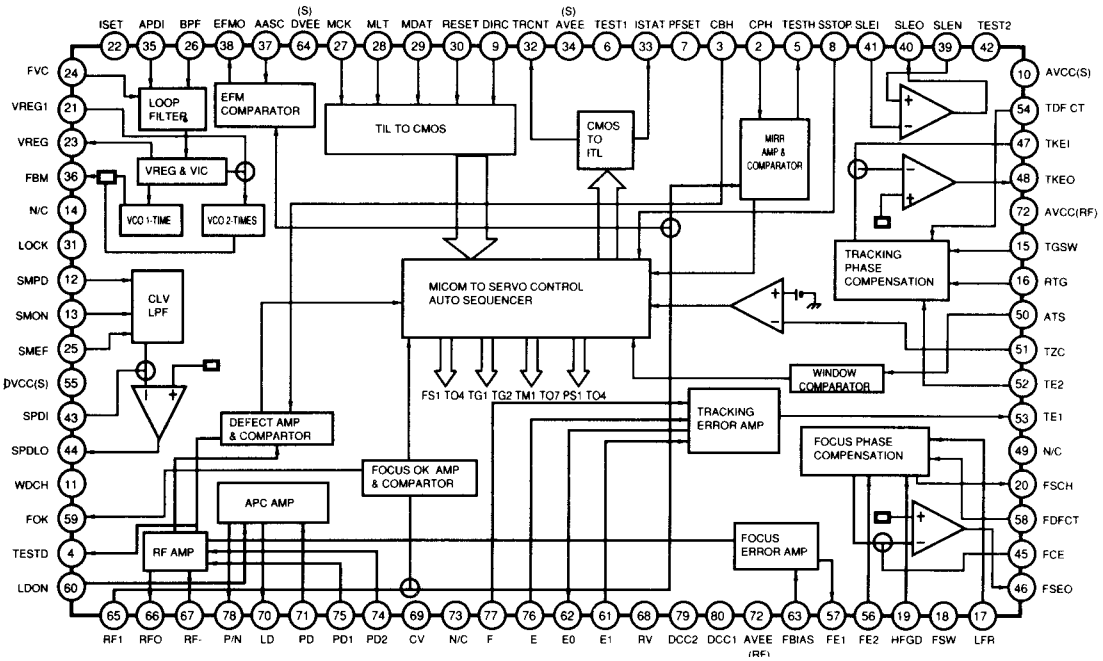
• SM 5870 (D/A CONVERTER IC) : XIC1



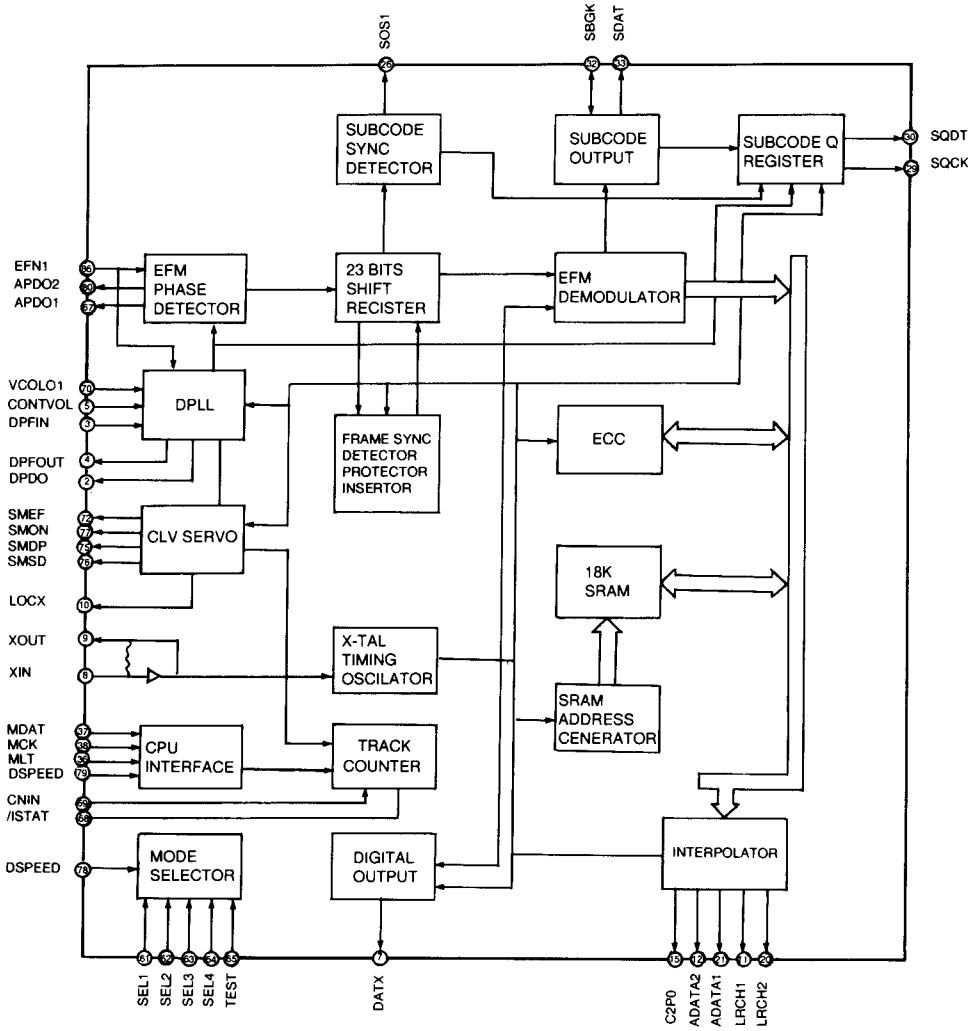
• KA 9258 (WIC61)



- KA9220


ISET APDI BPF EFMO AASC (S) DVEE MCK MLT MDAT RESET DIRC TRCNT (S) AVEE TEST1 ISTAT PFSET CBH CPH TESTH SSTOP SLEI SLEO SLEN TEST2
FVC VREG1 VREG FBM N/C LOCK SMPD SMON SMEF DVCC(S) SPDI SPDLO WDCH FOK TESTD LDON
AVCC(S) TDF CT TKEI TKEO AVCC(RF) TGSW RTG ATS TZC TE2 TE1 N/C FSCH FDFCT FCE FSEO
LOOP FILTER
EFM COMPARATOR
TIL TO CMOS
CMOS TO ITL
MIRR AMP & COMPARATOR
VREG & VIC
VCO 1-TIME
VCO 2-TIMES
CLV LPF
MICOM TO SERVO CONTROL AUTO SEQUENCER
TRACKING PHASE COMPENSATION
WINDOW COMPARATOR
FS1 TO4 TG1 TG2 TM1 TO7 PS1 TO4
TRACKING ERROR AMP
DEFECT AMP & COMPARTOR
FOCUS OK AMP & COMPARTOR
FOCUS PHASE COMPENSATION
APC AMP
RF AMP
FOCUS ERROR AMP
RF1 RFO RF- P/N LD PD PD1 PD2 CV N/C F E E0 E1 RV DCC2 DCC1 AVEE (RF) FBIAS FE1 FE2 HFGD FSW LFR

- KS9283



15. Electrical parts list

15-1. Amp & tuner section(MAX-485R)

15-1-1. Amp section

⚠ Static electricity

⚠ indicates parts for circuit safeguarding purposes. Therefore,when replacing, be sure to use specified parts only.

Location no.	Code no.	Description	Specification	Q'TY	REMARK
	11058-277-479	R-FUSIBLE	RF 1/4T 4.7-J	1	⚠
MR121, 333	11058-477-109	R-FUSIBLE	RF 1T 1-J	1	⚠
MR503					
NUM-NO	11059-072-400	R-FUSIBLE	RF 1/2T 10-J	1	⚠
MC22	11469-101-010	C-CERAMIC, AC	DE 7150FZ 103P VA1 KC A	1	⚠
MC21, MAC1				2	
MC71	11607-104-222	C-ELECTROLYTIC	MC SMS 25V 2200M	1	
MC69,70	11607-105-222	C-ELECTROLYTIC	MC SMS 35V 2200M	2	⚠
MC75	11607-106-331	C-ELECTROLYTIC	MC SMS 50V 330M	1	⚠
MC67,68	11609-116-332	C-ELECTROLYTIC	SMS 42V 3300M(18X35)	2	
MIC14	12109-401-690	IC-REGULATOR	MC7812C/KTA7812P	1	
MIC1,5,6,7,8	12119-401-170	IC-OP AMP	MC4558C	5	
MIC12	12119-401-330	IC-OP AMP	NJM4556S	1	
MIC1,9,10,18	12119-401-630	IC-DUAL OPAMP	MC4558S/NJM4558S	4	
MIC2	12119-401-720	IC-SWITCHING	TC4066BP	1	
MIC16	12119-601-160	IC-REGULATOR	TA78L005/MC 78L05AC	1	
MIC15	12119-601-770	IC-REGULATOR	MC7805	1	
MTR9	12139-103-560	TRANSISTOR	KSA 614-0	1	⚠
MTR11	12139-201-100	TRANSISTOR	KSA 928A-Y	1	
MTR5	12149-101-520	TRANSISTOR	KSA733-Y, TAPE	1	
MTR6L,6R,15,16	12149-301-820	TRANSISTOR	KSC1222-L, TAPE	6	
MTR1,12,3L,3R,	12149-301-900	TRANSISTOR	KSC 945-Y, TAPE	6	
4,12					
MTR8,10,13,14,	12149-301-930	TRANSISTOR	KSC1008-Y, TAPE	6	
STR1,2					
MTR2	12159-301-330	TR-DIGITAL	KSR2003, TAPE	1	
MD23, 24	12169-219-320	DIODE BRIDGE	PBP203 2A 200V	2	
MD22	12169-219-330	DIODE-BRIDGE	PBL403	1	
MZD5	12169-403-290	DIODE-ZN	50MW 7.7-8.7V UZ-8.2BM	1	
MZD9	12169-404-130	DIODE-ZN	500MW 5.3-5.9V UZ-5.6BM	1	
PSL1,2	12429-010-330	COIL-CHOKE,RND	27UH-K Q30 F2R5	2	
ML1, ML2	12429-060-031	COIL-CHOKE,SPK	2R2UH-K F7R9 RD 1/4P	2	
MJK2	13303-500-620	TERMINAL-BOARD PUSH	4P PUSH HOOK	1	
MJK3	13339-544-040	JACK-RCA	ABS & BST2 2P (S-348)	1	
PSWA1	13349-156-020	CONNECTOR-WAFER	5096-02C 2P	1	
FU2	14709-241-220	FUSE	T250V 1.25A 20 EUR SLOW	1	⚠
MWA10	16439-0168-00	CONNECTOR WIRE-BSS	5395/51088-09 10	1	
MJK1,4	A3040-0115	JACK-HEADPHONE	SOQ4694-01-4110 9P G	2	
MZD6	A4106-0062	DIODE-ZENER	UZP-33B 3L 4/34.6V 10MA	1	
VR1	B1050-0013	VR-ROTARY,METAL	RK16812MGL0UA 50KB	1	
MIC4	B4004-0287	IC-LOGIC	NJU4051 DTP	1	
MIC13	12119-208-080	IC-POWER	STK414V	1	
MWA5	B6010-0878	CONNECTOR-WAFER	FPC52045-3010 WHT	1	
MWA6	B6010-0882	CONNECTOR-WAFER	CFHG52641-1711 BLK	1	
MWA4	B6010-0921	CONNECTOR-WAFER	53244-1417 BRN J/MO	1	
	A1199-0116	TRANS-POWER	EI74X42 115/230V 50/60HZ B	1	⚠
	A6006-0187	POWER-CORD	KKP-419C KLCE-2F/0.75	1	⚠

(1) Amp front section

Location no.	Code no.	Description	Specification	Q'TY	REMARK
RAR1	11060-808-002	R-NETWORK	RMLS7J 472/RN 1/8 X 8P 47	1	
FVR1	11209-106-060	VR-ROTARY	RK16K 1130A01 53B	1	
FC2, 3	11407-057-200	C-CERAMIC	CC45T CH 50V 20-J	2	
FTR1,7,8	12149-101-520	TRANSISTOR	KSA733-Y, TAPE	3	
FTR2,3,5,6	12149-301-820	TRANSISTOR	KSC1222-L, TAPE	4	
FTR4	12149-301-930	TRANSISTOR	KSC1008-Y, TAPE	1	
FZD1	12169-404-130	DIODE-ZN	500MW 5.3-5.9V UZ-5.6BM	1	
FRE1	12199-101-240	REMOCON-EYE	MM-001M(16M/M)	1	
FLD1,5,6,7	12309-001-450	LED	SLR34VR TAPPING	4	
FLD2,3,4	12309-104-510	LED	SLR-35MG3 PI 3.1 GREEN	3	
FLT1	13322-0126-00	HOLDER-FL	MQ485R T1.5 BLK ABS	1	
FWA1	13349-170-061	CONNECTOR-WAFER	52170-0610	1	
FWA2,3	13349-170-101	CONNECTOR-WAFER	52170-1010	2	
FSW1,2,3,4,5	13559-901-100	SWITCH-TACT	SKHV10910A	5	
FSW6,7,8,9,10				5	
FSW11,12,13,14, 15				5	
FSW16,17,18,19, 20				5	
FJW10	14049-033-420	FERRITE BEAD	INDVCTOR 3857S TAPE	1	
FCF1	A1280-0017	CRYSTAL	12MHZ HC-49/U-A 50PPM DV-60	1	
FLT1	A4153-0061	V.F.DISPLAY	BJ-241GK AUDIO	1	⚠
FWA5	A6032-0055	WIRE-PLATE	30/200 UL2896-A-P7.25	1	
FC1	B1104-0170	C-ELEC	AC310-502-G473Z5R5/EECS5R5T4	1	
FIC1	B4000-0017	IC-OTP	LC86P6232 DTP	1	⚠
FWA5	B6010-0878	CONNECTOR-WAFER	FPC52045-3010 WHT	1	

15-1-2. Tuner section

Location no.	Code no.	Description	Specification	Q'TY	REMARK
TR11	11048-477-121	R-METAL OXIDE	RS1T 120J MINT TYPE	1	
TC9.10,11	11407-057-101	C-CERAMIC	CC45T CH 50V 100-J	3	
TC15	11407-057-200	C-CERAMIC	CC45T CH 50V 20-J	1	
TC16	11407-057-240	C-CERAMIC	CC45T CH 50V 24-J TAPE	1	
TC30	11407-057-470	C-CERAMIC	CC45T CH 50V 47-J	1	
TIC4	12109-401-270	IC-FUNCTION	LC7821	1	
MIC18	12109-401-700	IC-REGULATOR	MC79 12C	1	
TIC2	12119-203-220	IC-FREQ SYNTHESIZER	LM7000	1	
TIC9	12119-401-220	IC-CMOS AN/SW	NJU4053BD	1	
TIC1,5,6,7,10,11	12119-401-630	IC-DUAL OPAMP	MC4558S/NJM4558S	6	
TIC13,14				2	
TIC6	12119-401-720	IC-SWITCHING	TC4066BP	1	
TFET1,2	12139-601-450	TRANSISTOR	2SK583 TAPE	2	
TTR5,31	12149-101-520	TRANSISTOR	KSA/33-Y,TAPE	2	
TTR6,7,8	12149-301-860	TRANSISTOR	KSC838-0,TAPE	3	
TTR11L,11R,12L, 12R, 13L,13R	12149-301-900	TRANSISTOR	KSC 945-Y,TAPE	6	
TTR15L,15R,16L, 16R,17L,17R				6	
TTR19,20,21,22,2 3				5	
TTR1,2				2	
TTR3,4	12149-301-930	TRANSISTOR	KSC1008-Y,TAPE	2	
TTR9.,10	12159-301-330	TR-DIGITAL	KSR2003,TAPE	2	
TZD2,3	12169-403-690	DIODE-ZN	500MW UZ-6.8 BH	2	
TZD1	12169-404-110	DIODE-ZN	RD5.6FB/UZP-5.6B	1	
TL1	12429-508-100	COIL-CHOKE	AX 10UH-04	1	
TFL1L,1R	12450-304-040	COIL-LOW PASS FILTER	FV-A D-BASE	2	
TJK1	13339-544-020	JACK-AUX	4P	1	
TWA1	13349-171-061	CONNECTOR-WAFER	53114-0610	1	
TWA2,3	13349-171-101	CONNECTOR-WAFER	53114-1010	2	
TCY1	14539-501-140	CRYSTAL	HC-49/U 7.2MHZ 12P	1	
TUNER PACK	A1290-0007	TUNER-AM/FM	FTM2-3V 2G 300/75HM	1	
TJK2	A3059-0006	TERMINAL-BOARD,PUSH	SP-030 4P ANT	1	
TCY2	B1283-0041	RESONATOR-CERAMIC	2.0MHZ CST2.00MGT	1	
TCY3	B1283-0048	RESONATOR-CERAMIC	3.6MHZ CSA3.60MGF	1	
TIC12	B4012-0296	IC-LINEAR	M65830P DIP	1	
TWA4	B6010-0920	CONNECTOR-WAFER	52330-1417 BRN J/MO	1	

15-2. Cassette deck & CD section

15-2-1. Cassette deck main section

Location no.	Code no.	Description	Specification	Q'TY	REMARK
RR12	11048-477-101	R-METAL OXIDE	R-S1T 100-J MINT TYPE	1	
RR44	11048-477-270	R-METAL OXIDE	R-S1T 27-J MINT TYPE	1	
RR9	11048-477-561	R-METAL OXIDE	RS1P 560-J MINT TYPE	1	
RR4	11048-477-680	R-METAL OXIDE	RS1T 68-J MINT TYPE	1	
DSR1L,1R,2L,2R	11249-102-064	VR-SEMI TAPE-H	DVN-DJA A03B54(50K)	4	
LSR1L,1R	11249-102-094	VR-SEMI TAPE-H	DVN-DJA A03B25(200K)	2	
CSR1,2 DSR3L,3R	11249-102-104	VR-SEMI TAPE-H	EVN-DJA A03B23(2K)	4	
UC4, 5	11407-057-330	C-CERAMIC	CC45T CH 50V 33-J	2	
RC5	11607-103-222	C-ELECTROLYTIC	MC SMS 16V 2200M(12)	4	
RC1	11609-154-332	C-ELECTROLYTIC	SMS 25V 3300M(16X31)	1	⚠
DIC1	12109-323-990	IC-DOLBY	KA2271/KA2271B	1	
BIC1,2	12109-401-640	IC-ANALOG SWITCH	LC4066	1	
KIC2	12119-201-610	IC-AMPS	LA2010	2	
RIC1,2	12119-601-770	IC-REGULATOR	MC7805	1	⚠
CQ1,3,6	12139-201-100	TRANSISTOR	KSA928A-Y	3	
DQ4L, 4R	12139-601-450	TRANSISTOR	2SK583 TAPE	2	
BQ44	12149-101-520	TRANSISTOR	KSA733-Y, TAPE	1	
RQ4	12149-101-560	TRANSISTOR	KSA708-Y, TAPE	1	
BQ5L, 5R	12149-301-890	TRANSISTOR	KSC 945-L, TAPE	2	
CQ9, RQ3, 6	12149-301-900	TRANSISTOR	KSC 945-Y, TAPE	3	
LQ1	12149-301-930	TRANSISTOR	KSC1008-Y, TAPE	1	
RQ1, 2	12149-401-070	TRANSISTOR	KSD73-Y	2	⚠
LQ3, 4	12149-401-150	TRANSISTOR	KSD 471-Y, TAPE	2	
CQ2,4,5,7,8,10 LQ2 DQ1L,1R,2L,2R,3 JQ1,2 KQ1,3L,3R,4,5,6 BQ98,99	12159-301-520	TR DIGITAL	KSR1004	7 7 6 2	
BQ1, 2, 3, 4	12159-301-760	TR DIGITAL	KSR2004	4	
KQ2L, 2R, JQ44L, 44R	12159-301-790	TR DIGITAL	KSR1009	4	
UQ1	12159-301-840	TR DIGITAL	KSR1002, TAPE	1	
RD9, 13	12169-403-240	DIODE-ZN	1W9.4-10.V UZP-10B	2	
RD15	12169-403-290	DIODE-ZN	50MW 7.7.-8.7V UZ-8.2BM	1	
RD7, 3	12169-403-340	DIODE-ZN	IZP-9, 2R/RD9.1F 1W	2	
RD10	12169-403-740	DIODE-ZN	UZP 13B 12.4 -14.1	1	
DL1L,1R, KL1L,1R	12429-106-302	COIL TRAP	L.C PARALLET, 105K 100PF	4	
LL1	12619-573-071	COIL-CAN	AG 2.2MH F NON BLK	1	
BWR1	13078-493-130	CONNECTOR-WIRE/B.S	5264-03/5395-03	1	
KWR1	13078-795-120	CONNECTOR-WIRE/B.S	ERR-05/TC25-05HG	1	
CWF1	13349-135-110	CONNECTOR-WAFER	52004-1110 11P 1.5M	1	
DL2L, 2R	14529-414-050	FILTER-LOW PASS	10MM 19K/105KHZ	2	
UX1	14539-503-130	CERAMIC-RESONATER	CSA12.0MT	1	
KIC1	A4012-0297	IC-LINEAR	KA222920 QFP TAPE	1	
RD14	A4106-0121	DIODE-ZENER	UZP-30B 28/33V 10MA T	1	
UWF3	A6010-0169	CONNETOR-WAFER	53014-1510 2M/M	1	
UWF1	A6032-0054	WIRE-PLATE	34/300 UL2896-A AP7.25	1	
UIC1	B4002-0380	IC-MCU	LC86216A-5549 MQ485Z QFP	1	
LQ5L, 5R	B4054-0023	FET	2SK3/3-Y 400MW 6.5MA 100V N-CHA	2	
CWF2	B6010-0399	CONNECTOR-WAFER	52328-1310 13P WHT	1	
UWF1	B6010-0881	CONNECTOR-WAFER	FPC52045-3410 WHT	1	
DWF1	B6010-0882	CONNECTOR-WAFER	CFHG52641-1711 BLK	1	
SIC1	12119-401-630	IC-DUAL OPAMP	MC4558S/NJM4558S	1	
SWR1	13078-493-130	CONNECTOR-WIRE/B.S	5264-03/5395-03 2547 #28	1	

(1) Cassette deck front section

Location no.	Code no.	Description	Specfication	Q'TY	REMARK
FFR1	13078-382-130	CONNECTOR-WIRE/B.S	5264-02/JC25-02	1	
	13322-0017-00	HOLDER-FL	ABS T2.0 BLK MQ460R	1	
USW1, 2, 3, 4, 5, 6, 7, 8	13559-901-100	SWITHC-TACT	SKHV10910A	8	
USW9,10,11,12, 13,14,15				7	
USW16, 17, 18, 19,20				5	
UFL1	A4153-0062	V.F.DISPLAY	14-ST-09GK TAPE/CD	1	
FWF1	B6010-0880	CONNECTOR-WAFER	FPC52044-3410 WHT	1	

15-2-2. CD section

(1) CD main section

Location no.	Code no.	Description	Specfication	Q'TY	REMARK
WVR 1,2,3,4	11249-102-044	VR-SEMI TAPE-H	EVN-DJA A03B24(20K)	4	
XIC1	12109-303-280	IC-1BITDAC	SM5870CS	1	
WIC71	12119-203-500	IC MOTOR DRIVER	LB1641	1	⚠
XIC2	12119-401-630	IC-DUAL OPAMP	MC4558S/NJM4558S	1	⚠
WQ61	12139-201-100	TRANSISTOR	KSA 928A-Y	1	
WQ52	12149-101-520	TRANSISTOR	KSA733-Y,TAPE	1	
WQ1	12149-202-050	TRANSISTOR	KSB564A-Y	1	
WQ51	12149-301-900	TRANSISTOR	KSC 945-Y, TAPE	1	
XQ2	12149-401-150	TRANSISTOR	KSD 471-Y, TAPE	1	
WQ53, XQ1, XQ3	12159-301-780	TR DIGITAL	KSR 1003	3	
XZD1	12169-403-290	DIODE-ZN	50MW 7.7-8.7V UZ-8.2BM	1	
WZD71	12169-404-800	DIODE-ZN	500MW UZ-6.2BSB TAPING	1	
WL41	12429-070-350	COIL-CHOKE	AX 1.2UH-03(LAL03TB1R2M)	1	
XX1	A1280-0153	CRYSTAL	33.8688MHZ HC-49/U-S 50PPM	1	
WIC61	A4012-0169	IC-LINEAR	KA9258 SOP CD-4CH DRIVER	1	⚠
WIC01	A4012-0290	IC-LINEAR	KA9220 QFP RF+SSP	1	⚠
WIC41	A4012-0292	IC-LINEAR	KS9283 QFP DSP+DPLL	1	⚠

16. List of Abbreviation

AC	:	Alternating Current
Addr	:	Address
ADJ.	:	Adjustment
AGC	:	Automatic Gain Control
ALC	:	Automatic Level Control
AM	:	Amplitude Modulation
AMP	:	Amplifier
AMPS	:	Automatic Music program Search
ANT.	:	Antenna
ASSY	:	Assembly
BAL	:	Balance
BLK	:	Black
BLU	:	Blue
BPF	:	Band Pass Filter
BRKT	:	Bracket
CF	:	Ceramic Filter
ch	:	channel
cm	:	centimeter
COM	:	Common
CON MIC	:	Condenser Microphone
D	:	Depth
D/A Convertor:		Digital/Analog Convertor
dB	:	deciBel
DC	:	Direct Current
DEC	:	Decoder
DET	:	Decector
DEV	:	Deviation
DSP	:	Digital Signal Processor
DTS	:	Digital Tuning System
EA	:	Each
E-HEAD	:	Erase Head
EQ	:	Equalizer
FF	:	Fast Forward
F/F	:	Flip Flop
Fig	:	Figure
FM	:	Frequency Modulation
FREQ.	:	Frequency
GND	:	Ground
GRN	:	Green
GRY	:	Gray
H	:	Height, High
Hz	:	Hertz
IC	:	Integratde Circuit
IF	:	Intermediate Frequency
IFT	:	Intermediate Frequency Transformer
I/O	:	Input/Output
KHz	:	Killohertz
Kg	:	Killogram
L	:	Left, Low
LCD	:	Liquid Crystal Display
LED	:	Light Emiting Diode
LPF	:	Low Pass Filter
LW	:	Long Wave
Max	:	Maximum
MHz	:	Megahertz
min	:	Minimum
MOD	:	Modulation
MPX	:	Multipiex
MW	:	Medium Wave
NF or NFB	:	Negative Feedback
OP AMP	:	Operational Amplifier
ORG	:	Orange
OSC	:	Oscillator
PB	:	Playback
PCB	:	Printed Circuit Board
PLL	:	Phase Lock Loop
P/T	:	Power Transformer
R	:	Right
RAM	:	Random Access Memory
REC	:	Record
REG	:	Regulator
REW	:	Rewind
RF	:	Radio Frequency
ROM	:	Read Only Memory
R/P	:	Record/Play
sec	:	Second
SSG	:	Standard Signal Generator
SSP	:	Servo Signal Processor
ST	:	Stereo
ST/EJT	:	Stop/Eject
SW	:	Switch, Short wave
TP	:	Test Point
TR	:	Transistor
TRANS	:	Transformet
V	:	Volt
VIO	:	Violet
VCO	:	Voltage Controlled Oscillatro
VOL	:	Volume
Vpp	:	Voltage peat or peak
VR	:	Volume
Vref	:	Reference Voltage
V/SEL	:	Voltage selector
VTVM	:	Vaccum Tube Volt Meter
VVC	:	Voltage Variable Capacitance
W	:	Watt or Weight
WHT	:	White
X or X-tal	:	Crystal
YEL	:	Yellow